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Former Method Bulletin No.	*Title*
162	Contributions to Anthropology, 1957
167	Contributions to Anthropology, 1958
173	Contributions to Anthropology, 1959
180	Contributions to Anthropology, 1960, Part I
190	Contributions to Anthropology, 1960, Part II
193	Contributions to Anthropology, 1961–62, Part I
194	Contributions to Anthropology, 1961–62, Part II
204	Contributions to Anthropology, 1963–64, Part II
206	Contributions to Anthropology, 1963–64, Part I

New Method

162	Contributions to Anthropology I
167	Contributions to Anthropology II
173	Contributions to Anthropology II A
180	Contributions to Anthropology III: Archaeology and Physical Anthropology
190	Contributions to Anthropology III: Ethnology
193	Contributions to Anthropology IV: Archaeology and Physical Anthropology
194	Contributions to Anthropology IV: Ethnology
204	Contributions to Anthropology V: Ethnology
206	Contributions to Anthropology V: Archaeology and Physical Anthropology
224	Contributions to Anthropology VI: Archaeology and Physical Anthropology
232	Contributions to Anthropology VII: Archaeology and Physical Anthropology

Contents

Cree Culture History in the Southern Indian Lake Region, by J.V. Wright, 1

The Archaeology of the Fossil Bay Site, Sucia Island, Northwestern Washington State, in Relation to the Fraser Delta Sequence, by R.S. Kidd, 32

Canadian Archaeological Radiocarbon Dates, compiled by Roscoe Wilmeth, 68

Preliminary Report on the Muhlbach Site: A Besant Bison Trap in Central Alberta, by Ruth Gruhn, 128

An Archaeological Survey of Western Victoria Island, N.W.T., Canada, by Robert McGhee, 157

List of Plates and Figures

Paper No. 1

Plates I. MacBride Site, 27
II. Neck Site — Stratum I, 29
III. Neck Site — Stratum II, 31

Figure 1. Site locations, 2

Paper No. 2

Plates I. Fossil Bay Site, view to east-southeast, 35
II. Fossil Bay Site, view to north-northwest, 37
III. Fossil Bay Site, Locality A, 38
IV. Fossil Bay Site, Locality A, stratification of north wall, 38
V. Fossil Bay Site, Locality B, 41
VI. Fossil Bay Site, chipped and ground stone, 63
VII. Fossil Bay Site, ground stone and antler, 65
VIII. Fossil Bay Site, incised stone, ground antler bone and shell, 67

Figures 1. Map of Sucia Island State Marine Park, 34
2. Sketch of Site 45SJ105, Fossil Bay Locality A, 36
3. Fossil Bay Site, Locality A, stratigraphic profile, 39
4. Sketch of Site 45SJ105, Fossil Bay, Locality B, 40
5. Fossil Bay Site, Locality B, stratigraphic profile, 42

Paper No. 3

Figure 1. C-14, Dated sites in Canada, 127

Paper No. 4

Plates I. Bone bed exposed in Square A13, 147
II. Bone bed exposed in Square A22, 148
III. Bone bed exposed in A13/B13 baulk, 149
IV. Upright bones in west wall of Square B10, 150
V. Projectile points, 151
VI. Projectile points, 152
VII. Projectile points, 153
VIII. Selected sample of projectile points, 154
IX. Projectile point collection of Robert Graham, 155
X. Artifacts of other kinds, 156

Figures 1. Map of major vegetation zones of Alberta, 129
2. Environment of Muhlbach Site, 131
3. Area of excavation at Muhlbach Site, 132
4. Profile sections AA' and BB', 134
5. Distribution of bones, artifacts and features, 136
6. Scatter diagrams, 141

Paper No. 5

Plates I. Pre-Dorset artifacts, 175
II. Dorset bone artifacts, Joss Site, 177
III. Dorset bone artifacts, Joss Site, 179
IV. Dorset stone artifacts, Joss Site, 181
V. Dorset artifacts, other sites, 183
VI. Thule artifacts, Memorana Site, 185
VII. Thule artifacts, Memorana Site, 187
VIII. Thule artifacts, Memorana Site, 189
IX. Kunana Site harpoon heads, 191

Figure 1. Map of central Canadian Arctic, 160

CREE CULTURE HISTORY IN THE SOUTHERN INDIAN LAKE REGION*

By J. V. Wright

RÉSUMÉ

Les relevés archéologiques faits en 1965 et 1966 dans la région du lac Southern Indian dans le nord du Manitoba, ont fourni suffisamment de renseignements pour nous permettre d'appliquer la méthode historique directe à un groupe local de Cris. On ne possède pas de preuve évidente quant à leur occupation de la région avant le Xᵉ siècle. Toutefois, à partir du Xᵉ siècle, des données nous permettent de constater l'évolution culturelle traditionnelle et progressive d'une population identifiée, d'après des documents historiques, comme étant une tribu de Cris. Nous basons cette évolution sur deux sites, un de l'époque historique (vers les années 1700) et l'autre, de l'époque préhistorique, un site aux couches stratifiées.

SUMMARY

Archaeological surveys in 1965 and 1966 in the Southern Indian Lake region of northern Manitoba provided sufficient information to apply the direct historical approach to a local group of the Cree Indians. Evidence of a significant occupation of the region until the 10th century is lacking. From the 10th century to the historic period, however, data are available which indicate the gradual and conservative cultural development of a population identified by historical documents as one of the bands of the Cree. Two sites, one historic (*circa* A.D. 1700) and the other a stratified prehistoric site, are relied upon to trace this development.

INTRODUCTION

Information recovered during the archaeological surveys of 1965 and 1966 in the Southern Indian Lake region of northern Manitoba (Figure 1) appears to be sufficient to apply the direct historical approach to a local group of the Cree. The local aspect of the study is emphasized, since it is anticipated that a widely distributed population such as the Cree will possess a number of regional archaeological expressions. Of the 36 sites recorded, two are sufficiently informative to warrant detailed description. Data from other sites will be used in a supplementary fashion.

The main purpose of the surveys was to trace the northwestern distribution of the Laurel tradition: a Middle Woodland period assemblage occurring in east-central Saskatchewan, the southern half of Manitoba, northern Minnesota, Northern Ontario, and western Quebec. Fragments from one late Laurel tradition vessel were recovered. The paucity of Laurel tradition material was compensated for by the relative abundance of Late Woodland period sites assignable to the Selkirk focus (MacNeish 1958; Hlady MS.). Only two of all the sites located, however, could be profitably excavated. The remainder, including one stratified site, were characterized by a thin veneer of debris represented by firestone fragments, chipping detritus, bone

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*Presented at the Society for American Archaeology meeting, Ann Arbor, Michigan, 1967.

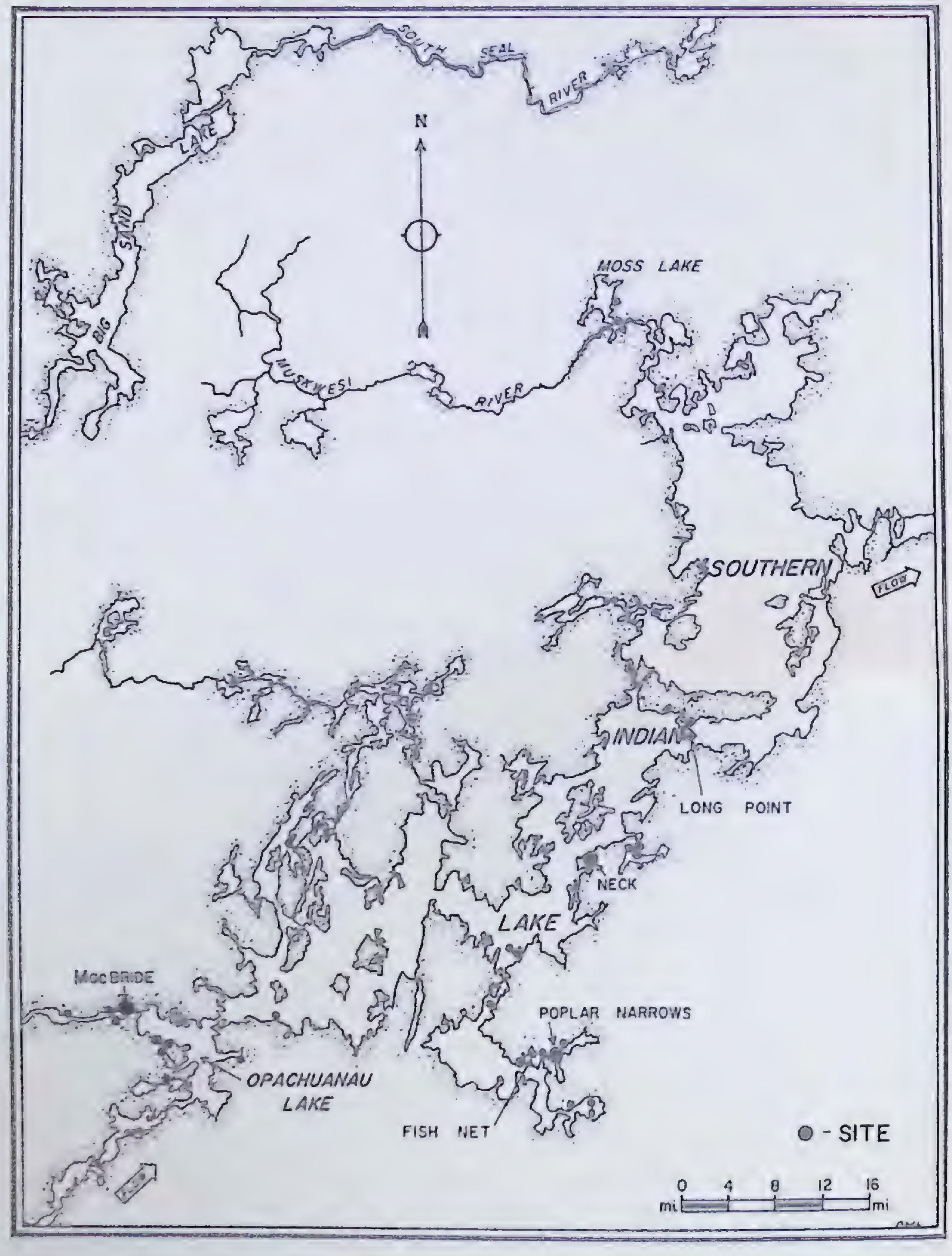

FIGURE 1—*Site locations*

refuse, and the occasional artifact. Selkirk focus ceramics were present on 19 sites, and the remaining locations appeared to represent contemporary non-pottery sites rather than early pre-pottery sites. This impression of contemporaneity was reinforced by the radiocarbon dates from a non-pottery stratified site which paralleled the radiocarbon dates from a stratified pottery site. Therefore there exists a paradoxical situation which suggests that the Southern Indian Lake region was largely unoccupied prior to the 10th century. Neither geological nor survey factors offer any reasonable explanation for this apparent lack of time depth. Indeed, work in the Pelican Narrows region of east-central Saskatchewan has indicated that a considerable archaeological time span does exist further to the west on the Churchill River drainage (Brown 1962).

On the basis of the available data, it can be stated that the Southern Indian Lake region only attained a significant population during the Late Woodland period. Further, these data appear to be sufficient to outline the development of an indigenous Cree population from approximately A.D. 900 to the historic period (*circa* A.D. 1700). The two excavated sites from which most of the pertinent data were obtained are the MacBride site and the Neck site.

THE MACBRIDE SITE (HeLw-1)

The site is located near the embouchure of the MacBride River into the Barrington River. The latter flows into Opachuanau Lake, which is located near the southwest corner of Southern Indian Lake. Scattered along a narrow clay beach was a veneer of camp refuse, which followed the shoreline for approximately 100 yards and rarely extended inland more than 20 feet. Excavations were restricted to a large exposed hearth composed of firestones and a limited area of relatively rich refuse. The two excavations were 12 feet apart.

In the midden excavation, which involved approximately 100 square feet, European trade items were found in direct association with aboriginal artifacts and refuse. Particularly abundant in the refuse were firestone fragments, carbonized bone, and hematite-stained micaceous clay. Since the depth of the deposit never exceeded 6 inches and was as shallow as 1½ inches, there existed a possibility of component mixture, despite the apparent direct association between the European and native artifacts. Therefore, as a precautionary measure, two charcoal samples were taken from the base of the deposit where they rested on the sterile clay subsoil. The resultant dates of post A.D. 1800 (Gak-1255) and A.D. 1590±100 (Gak-1267) support the premise that the deposit is late and increase the likelihood of the observed association between European and native artifacts. Later materials, consisting of a .22-calibre cartridge, an iron fragment, a highly corroded bone awl, and some raw bone fragments, were found in the turf above the deposit and along the east side of test trench 2 where the cultural layer only attained a depth of 1½ inches.

Feature 1 consisted of a mounded mass of fire-fractured rocks resting on either sterile clay or a thin lens of sterile beach sand. The major portion of the feature was composed of a loose firestone deposit, which contained a chitho, a body sherd, two bones, and five flakes and covered an area 8 feet by 6 feet. Adjacent to the northern edge of the loose firestone portion of the feature were two smaller but more compact firestone masses, which were appended to the main body of the feature like two beads. Each of these secondary hearths measured approximately 2.5 feet by 2 feet. One of the concentrations attached to the main body of the feature produced an arrowhead, four scrapers, two body sherds, six flakes, and a quantity of carbonized bone. The other, secondary, hearth was sterile. It would appear that Feature 1 actually represented several discrete hearths, but reuse of the firestones had, to a large extent, obliterated the original outlines.

Ceramic Analysis

Rim sherd fragments from more than ten vessels were recovered from the site. It was not possible to determine whether an additional number of smaller sherds represented separate vessels or were merely rim variations belonging to a single vessel. Ten specimens larger than a 50-cent piece could be recognized, however, as fragments from different vessels. Another six rim sherds, half the previous size, may or may not represent separate vessels, and will be given only cursory consideration.

Vessel 1 (Plate I, fig. 1)

The rim profile suggests that vessel 1 was a bowl rather than a pot. This interpretation is based upon the fact that no rolled rims have ever been reported for the Selkirk focus, and therefore rims with a marked interior concavity probably pertain to bowls, a vessel form that has been found in the area under consideration. Babiche impressions cover the exterior, the flat lip, and a short distance of the interior rim. A row of encircling exterior punctates raises a corresponding row of interior bosses. These punctates are 6 mm below the lip, 5 mm apart, and 6 mm by 2 mm in dimension. Interior striae are present. Of all the rim sherds recovered from the MacBride site, this is the only one that clearly relates to previously known Selkirk ceramics. Thickness one inch below the lip measures 7 mm.

Vessel 2 (Plate I, fig. 2)

Vessel 2 is fairly typical of the majority of the vessels recovered from the MacBride site. Its profile indicates that it was a bowl rather than a pot. All the surfaces lack babiche impressions, and although an effort has been made to smooth the exterior, it is still irregular as a result of sloppy modelling and the extension of clay granules above the surface. Tempering appears to be absent except for the occasional particle, which was probably accidental. The clay granules, which resemble tempering, are more likely a product of poor working of the clay prior to firing, rather than purposeful inclusions. During the excavation it was noted that the sterile clay subsoil had a strong tendency to separate into small cuboid particles, a characteristic that might explain the presence of clay granules within the regular paste of the vessel. The lip is irregular, ranging from flat to pointed, and has been carelessly pinched to produce a slightly sinuous edge. Horizontal striae are apparent on the interior, and indeed there appears to have been more attention paid to smoothing the interior of the vessel than the exterior. Thickness one inch below the lip is 9 mm.

Vessel 3

This vessel, which is a bowl, is very crude; both the exterior and interior appear corroded and irregular. The pointed to rounded lip has been pinched to give it a scalloped appearance. Tempering appears to be absent except for the clay granule inclusions. Thickness one inch below the lip is 8 mm.

Vessel 4 (Plate I, fig. 4)

The profile of this vessel suggests that it was a very shallow bowl. A broad incision 4 mm wide encircles the rim immediately below the lip, thereby producing an overhanging lip. Careful smoothing of the exterior and interior of the sherd is apparent, and although tempering is still sparse, there are far more sand particles present than was the case with the preceding two vessels. Thickness one inch below the lip is 8 mm.

Vessel 5 (Plate I, fig. 3)

The single rim sherd from this vessel indicates that it was part of a very crude bowl. Both the exterior and interior are very irregular and lumpy. A single broad incision, 4 mm to 5 mm wide, runs from the lip diagonally across the exterior of the sherd. Clay granules are abundant in the paste, but no tempering material is observable. The lip has been pinched to produce an irregularly sinuous edge, which varies from pointed to rounded. Thickness one inch below the lip is 9 mm.

Vessel 6

The markedly concave interior of this rim indicates that it was a portion of a shallow bowl. The exterior and interior are relatively smooth, and the lip is uniformally round and slightly undulating. Both tempering and clay granule inclusions are absent. Thickness one inch below the lip is 9 mm.

Vessel 7

This rim fragment is apparently from a small bowl. A short horizontal incision immediately below the lip may be accidental. The interior has been carefully smoothed, although the exterior has an irregular appearance with numerous indentations. The lip is pointed, and thickness one inch below the lip is 3 mm.

Vessel 8

Fragments from this vessel also appear to represent a small bowl. The interior and, to a lesser extent, the exterior possess a number of small pits suggesting that a quantity of organic material had been included with the paste prior to firing. The lip ranges from pointed to rounded, and the edge is significantly curved, suggesting that the fragment is from a very shallow bowl that is nearly dish-like. Thickness one inch below the lip is 6 mm.

Vessel 9

In contrast to the preceding vessels this fragment appears to have come from a small pot. Under normal circumstances the sherd would be regarded as a product of a juvenile learning the ceramic art. In view of the crudity of most of the vessels from the site, however, the specimen may well represent the product of a mature person. Both surfaces have been carefully smoothed, and the lip is very pointed. A single rock particle is the only evidence of tempering. Thickness one inch below the lip is 6 mm.

Vessel 10 (Plate I, fig. 5)

Fragments of this vessel were recovered from the surface of the site inland from the excavations. It was a pot, and the attributes relate it to the Blackduck focus and not to the regionally dominant Selkirk focus. The exterior is plain except for a row of encircling elliptical punctates, which raise interior bosses. Punctates are 22 mm below the lip, 14 mm apart, and 12 mm high. The markedly splayed-out lip contains oblique cord-wrapped stick impressions, and the interior is plain except for the bosses. An abundance of grit temper is present. Thickness of the lip and thickness one inch below the lip are 14 mm and 9 mm, respectively.

Additional Rim Sherds

There were six rim sherds approximately the size of a 25-cent piece. Because of their size and the crudity of the plain ware at the site, it is not possible to be certain if they represented fragments from additional vessels. Five fragments probably relate to bowls, and the remaining fragment is from a small pot. Two of the specimens are decorated. A bowl fragment possesses a single, encircling, horizontal, incised line 11 mm below the lip. The one specimen that may represent a small pot has a row of thin, crudely incised obliques below the lip. The only other comment that can be made is that the two specimens are so markedly concave on the interior that they must have represented very shallow bowls. Tempering is absent except for the sporadic occurrence of clay granules.

Body Sherds

Excluded from the analysis were a large number of sherdlets. Poor firing appears to have resulted in high fragmentation. All of the 60 analysable body sherds recovered from the refuse are plain and possess the temperless to slightly tempered paste with clay granule inclusions that characterized the majority of the previously described rim sherds. These sherds occasionally have horizontal smoothing striae on the interior or, less frequently, on the exterior. Thicknesses range from 3 mm to 12 mm with a mean of 7.6 mm.

Three additional body sherds were obtained from Feature 1. All three sherds lack a surface, and all contain a relatively high frequency of grit temper. With respect to the temper, the three sherds are more typical of the ceramics of the region than is the already described dominant pottery at the site with its temperless to near-temperless paste. The occurrence of the three tempered sherds in Feature 1 and the absence of similar sherds in the refuse deposit except for vessel 1 suggest that a possible time difference exists between the two excavated regions. Therefore, as a precaution, the stone materials from Feature 1 will be described separately from the specimens recovered in the refuse deposit excavation.

Miscellaneous Ceramics

Two lumps of moulded clay were recovered from the refuse deposit. Both of these specimens lack temper.

STONE ANALYSIS

Five stone artifacts were recovered from the refuse deposit: a hammerstone, a side scraper, a ground flake chisel scraper, a problematical scraper-knife, and a wedge.

Hammerstone

The hammerstone consists of an extensively used natural cobble, and except for the pecking facets no other form of modification is apparent. Major hammering facets occur at both ends and along three edges.

Side Scraper (Plate I, fig. 11)

The side scraper has retouch along one edge of a rectangular quartz flake 38 mm by 23 mm. Retouch extends for a length of 36 mm and is 2 mm in height.

Flake Chisel (Plate I, fig. 7)

This unusual specimen consists of a trianguloid igneous flake which has bifacial grinding at the base of the triangle to produce a symmetrical cutting or scraping edge. One edge has also been retouched to produce a scraping face. Length, basal width, and thickness measurements are 60 mm, 40 mm, and 9 mm. The scraping edge is 30 mm long and 4 mm high. A limited amount of polish on both faces of the upper end of the tool appears to be more likely the result of hafting wear than purposeful grinding.

Problematical Scraper-Knife (Plate I, fig. 8)

This trianguloid flint flake has unifacial flaking at the apex end for a distance of approximately 20 mm. The opposite face from the flaked surface is thick and has been extensively battered prior to the flaking of the worked face. Length, maximum width, and thickness measurements are 48 mm, 26 mm, and 9 mm, respectively. The artifact could have functioned as a scraper, a knife, or both.

Wedge (Plate I, fig. 9)

The single quartz wedge is trianguloid in shape with a length measurement of 32 mm, which is also the measurement between the two crushed edges. Width and thickness measurements are 24 mm and 7 mm. It is inferred that the specimen functioned as a general cutting and scraping tool and that its form is the result of sharpening the edge of a thick flake by bi-polar crushing.

Seven stone tools were recovered from Feature 1. These are as follows: three end scrapers, two random scrapers, a chitho, and an arrowhead. The chitho and one of the random scrapers came from the loosely consolidated portion of the feature whereas the remaining specimens were found in one of the compacted firestone concentrations appended to the main body of the feature. The three end scrapers came from one edge of the feature, and the random scraper and the arrowhead occurred at the opposite edge.

End Scrapers (Plate I, figs. 12 and 13)

Two of the scrapers are trianguloid, and the other is lacking its base. All three have some ventral retouch and high-backed retouched dorsal surfaces. Scraping faces are restricted to the end. Length ranges from 15 mm to 24 mm with a mean of 19.7 mm. Maximum width, which is at the scraping face, ranges from 16 mm to 20 mm, with a mean of 18 mm. Height of the end scraping faces ranges from 8 mm to 11 mm with a mean of 9.3 mm. One of these specimens also appears to have functioned as a burin (fig. 13). The end opposite the scraping face has had two or more flakes removed to produce the required sharp projection. There is a possibility, however, that this appended feature is fortuitous.

Random Scrapers

One random scraper possesses a single scraping face 32 mm long and from 3 mm to 5 mm high. The other random scraper has two scraping faces 19 mm and 13 mm long with face heights of 2 mm and 1 mm, respectively.

Chitho (Plate I, fig. 6)

The single chitho was made from a flat slab of schistose 11 mm thick. One edge, 70 mm long, had been unifacially bevelled by flaking to produce random scraper and the arrowhead occurred at the opposite edge.

Arrowhead (Plate I, fig. 10)

The arrowhead is side-notched, and both the basal and blade edge configurations are slightly convex. Although the tip is missing, the length is estimated to have been 35 mm. Basal width, width between notches, and shoulder width are 17 mm, 13 mm, and 20 mm, respectively. Stem length and thickness are 8 mm and 5 mm. The point possesses over-all fine bifacial retouch.

Chipping Detritus

Chipping detritus was very sparse and consisted of the following: quartz flakes 72 gm, quartz core 30 gm, igneous or metamorphic rock flake 5.5 gm, and flint flake 0.5 gm.

EUROPEAN TRADE ITEMS

Glass Bead (Plate I, fig. 15)

The single glass bead, which is split laterally, is an opaque white elongate spheroidal variety, which G. I. Quimby states (1966, appendix 4) is one of the diagnostic varieties of the Middle Historic period (A.D. 1670–1760).

Musket Ball (Plate I, fig. 14)

The lead musket ball had been flattened at one end, probably through impact, and had been cut and slotted at the other end apparently to obtain fragments of the metal. Despite the specimen's rather mutilated condition, it is possible to estimate its original diameter to have been 14 mm.

Lead Strip

A small lead strip, roughly diamond-shaped, was recovered. It is 1 mm thick and may well be a flattened fragment cut from the previously described musket ball.

Copper Rectangles (Plate I, fig. 16)

Two very corroded copper or brass rectangles were probably cut from a trade kettle. Both specimens measure 23 mm by 19 mm and are less than 1 mm in thickness.

BONE ANALYSIS

Carbonized bone fragments were relatively common in both the refuse deposit and Feature 1. The bone, however, is so highly fragmented that no specie identification would appear to be possible. In the overlying organic turf the occasional highly corroded raw bone fragment was recovered. Pike remains were all that could be identified. An extremely corroded bone awl was also found in the turf. The specimen possesses a circular cross-section and is 131 mm long.

THE NECK SITE (HfLq-1)

The site is located on Southern Indian Lake along the northern portion of a long sand neck connecting a large island to the mainland. The Hudson Bay Post at South Indian is approximately 16 miles to the southwest.

Although veneer debris parallels the shoreline for at least 200 yards, the excavatable portion of the site was limited to less than a 25-foot section, which extended inland for approximately 15 feet. This restricted area was nestled between two high clay-sand bluffs with a dry creek-bed along one edge. It appears that this restricted location was favoured because the bluffs afforded protection except from a west wind. Wave action, however, was sufficiently strong to deposit sands and gravels over the floor of the small ravine, thereby producing a stratified site. The intensity of the erosional and depositional forces is attested to by the cutting of the natural podzol soil zone and the depositing of sands and gravels at 4.5 feet above the July 15, 1965 water-level. Further, a cobble-pebble beach more than twenty feet wide occurs between the site edge and the water edge. The deposition of sands and gravels, however, was not sufficient to completely stratify this small area of the site, and as excavations extended inland, the two components, segregated by a sterile deposit, pinched together to form a single refuse deposit. As a result, materials were recorded by Stratum I, Stratum II, and Strata I and II as dictated by the stratigraphic situation. Additional strata, in the southern portion of the excavations, were found to diverge from Stratum II. These strata were angled sharply downward, and although they were followed to depths of over four feet, they produced nothing other than a few water-washed fish and animal bones. The angles of these strata and the absence of archaeological remains suggest that they represent old forest floors occurring along the bank of the small stream, which subsequently shifted southward, and that the old stream cut was then filled with sterile sands and gravels.

The more than 480 square feet excavated completely removed the stratified portion of the site as well as a substantial portion of the relatively rich deposit represented by the combined Strata I and II. A small quantity of material was obtained from the surface and from tree-fall disturbances. In one of the tree-falls the remains of a firestone hearth were noted.

Features encountered in the excavated portion of the site consisted of a firestone hearth and a hearth floor lacking firestone. The first feature occurred in Stratum I and consisted of a circular mass of ten large firestones with a collective diameter of 2 feet. The firestones were mounded to a central height of 8 inches, and, indeed, it was this feature, occurring in thick undercover, which lead to the discovery of the refuse concentration. Pottery, stone tools, chipping detritus, and firestone flakes surrounded the hearth. The other feature, also associated with Stratum I, consisted of an irregular 1- to 3-inch deposit of dense ash containing the odd fragment of carbonized bone and firestone. The feature is interpreted as a hearth floor.

Five radiocarbon dates are available for the components of the Neck site. The readings were obtained from Gakushuin University Laboratory, Tokyo, and from Isotopes, Inc. The dates from Isotopes, Inc. are as follows: Stratum I—A.D. 1515±110 (I-2078); and Stratum II—A.D. 1220±150 (I-2081) and A.D. 1245±320 (I-2082). The Gakushuin University dates are as follows: Stratum I—A.D. 1190±80 (Gak-1259); and Stratum II—A.D. 760±70 (Gak-1260). Although both series of dates confirm the stratigraphic sequence at the site, the Gakushuin dates are consistently earlier than the Isotopes dates. On the basis of what is currently known of the Selkirk focus time span, I would tend to favour the Isotopes, Inc. readings. This is certainly not to say that the Gakushuin dates are too early. Our knowledge of the time depth of the Selkirk focus is too limited to warrant a dogmatic statement on the relative accuracy of the two sets of readings, and my favouring of the Isotopes dates stems more from intuition than conviction.

THE NECK SITE—STRATUM I

CERAMIC ANALYSIS

Rim sherds—Rim sherd fragments were recovered from seven vessels: five pots, one plate, and one bowl.

Vessel 1

A large portion of this pot was reconstructible. The vessel stands approximately 19 cm in height and has an approximate orifice diameter of 14 cm. The shape is strongly globular with a slightly pointed base. The rim is slightly everted, although a thickening below the lip on the exterior has resulted in a rudimentary and crude collar. A shoulder is readily apparent although not carinated. Smoothed-over babiche impressions cover the entire exterior of the vessel, and similar impressions occur on the lip. Horizontal scraping striae are apparent on the interior. An encircling row of exterior punctates has raised pronounced interior bosses. The punctates are 9 mm below the lip, 12 mm apart, and 4 mm in diameter. Grit temper is present, the lip is rounded, and the thickness one inch below the lip is 13 mm. A curious feature is the two circular holes in the bottom of the pot. The holes are 4 mm in diameter and 18 mm apart and were punched through when the clay was wet.

Vessel 2 (Plate II, fig. 2)

Sufficient rim fragments of this vessel were recovered to estimate the oval orifice to have been 13.5 cm by 12 cm. It is possible that these measurements have been effected by warped reconstruction. The rim is everted, and an incipient shoulder is present.

The entire exterior and the lip of the rim are covered with smoothed-over babiche impressions. Below the lip an encircling row of exterior circular punctates has raised prominent interior bosses. These punctates are 7 mm below the lip, 7 mm apart, and 4 mm in diameter. Below this first row of punctates is a second row occurring above the incipient shoulder. These punctates are circular and also raise interior bosses. They occur 40 mm below the lip, 24 mm apart, and are 3 mm in diameter. The lip is flat to rounded, and the thickness one inch below the lip is 10 mm.

Vessel 3 (Plate II, fig. 1)

Sufficient rim fragments of this vessel were recovered to estimate the orifice diameter at 14 cm. The rim is everted, but no evidence of a shoulder is present. The lip is slightly splayed-out. The entire surface including the lip is covered with relatively clear babiche impressions. Below the lip an encircling row of circular punctates raises prominent interior bosses. These punctates are 7 mm below the lip, 13 mm apart, and 5 mm in diameter. The lip is predominantly flat, and the thickness one inch below the lip is 7 mm.

Vessel 4

This rim is slightly everted with a flat lip. The exterior surface and the lip are covered with smoothed-over babiche impressions. An encircling row of circular punctates occurs below the lip and raises prominent interior bosses. The punctates occur 10 mm below the lip, 11 mm apart, and are 5 mm in diameter. Thickness one inch below the lip is 10 mm.

Vessel 5

This rim is slightly everted with no evidence of a shoulder. The lip is rounded and impressed with what was probably a babiche fabric, leaving a series of oblique impressions. The interior rim for a distance of 8 mm also has what appears to be fabric impressions. The exterior is covered with very much smoothed-over babiche impressions. An encircling row of tear-drop-shaped punctates occurs on the exterior below the lip and raises prominent interior bosses. They occur 14 mm below the lip, 8 mm apart, and are 9 mm in height. Thickness one inch below the lip is 7 mm.

Vessel 6 (Plate II, fig. 4)

A rim section over 15 cm long from this vessel clearly demonstrates by its edge curvature that it is a fragment of a plate or a very shallow bowl rather than a pot. The flat edge is covered with babiche impressions, and the interior for 15 mm from the edge has clear encircling babiche impressions. The fissured and fissile exterior has smoothed-over babiche impressions. Grit temper is present, and the thickness one inch from the lip is 7 mm. The interior has been carefully smoothed except for the encircling babiche impressions.

Vessel 7 (Plate II, fig. 3)

This rim section has a concave interior and a convex exterior. As all known Selkirk pots have straight to everted rims and as no rolled rims are known, it is inferred that the specimen under question is a fragment from a bowl. The exterior and lip are covered with smoothed-over babiche impressions. Grit temper is present, and the thickness one inch below the flat lip is 10 mm.

Body Sherds (Plate II, figs. 7 and 8)

The 309 body sherds were represented by 284 (91.9 per cent) smoothed-over fabric-impressed sherds and 25 (8.1 per cent) fabric-impressed sherds. All the fabric-impressed specimens appear to represent examples of twined babiche, and the smoothed-over fabric-impressed sherds almost certainly relate to the same fabric type. Indeed, the two body sherd categories are probably not too meaningful since smoothing of the exterior surface appears to have been a somewhat erratic procedure. The fabric-impressed sherds range from 4 mm to 8 mm in thickness with a mean of 5.6 mm, and the smoothed-over fabric-impressed sherds range from 3 mm to 10 mm with a mean of 5.3 mm.

STONE ANALYSIS

The following stone tools were recovered from Stratum I: scrapers 10 (38.5 per cent); hammerstones 6 (23.1 per cent); knives 2 (7.7 per cent); wedges 2 (7.7 per cent); graver 1 (3.8 per cent); anvil stone 1 (3.8 per cent); mano 1 (3.8 per cent); scraping plane 1 (3.8 per cent); utilized firestone fragment 1 (3.8 per cent); and paintstone 1 (3.8 per cent).

Hammerstones

The six hammerstones are all natural ovate to ovate acuminate cobbles, which have been used at both ends.

Scrapers

Ten of the scrapers may be broadly classed as side scrapers (6), end scrapers (3), and cobble scraper (1).

Side scrapers—Five of the side scrapers consist of flakes with retouch along one edge (Plate II, figs. 6 and 10). The remaining specimen, which may be a core tool, has retouch along both edges. One scraper has retouch on the opposite face of the major bevelled face and may have functioned as a knife. Another has retouch on the opposite face but not adjacent to the other retouched edge. Shape and manner of working these tools vary greatly. Length of retouched edge ranges from 21 mm to 64 mm with a mean of 42.5 mm. Height of scraping faces ranges from 2 mm to 21 mm with a mean of 7.8 mm. This high mean, however, results from the inclusion of the core tool measurement of 14 mm and 21 mm for the scraping edge heights.

End scrapers—Two of the three specimens have retouch at the end only (Plate I, fig. 13). The other has retouch along one side as well, but on the ventral face. This latter scraper also possesses what appears to be a burin to one side of the scraping face (Plate I, fig. 12). Scraping face widths range from 18 mm to 21 mm with a mean of 19.7 mm. Scraping face heights range from 3 mm to 5 mm with a mean of 3.7 mm.

Cobble scraper—A large quartz cobble fragment weighing 472 gm possessed a scraping edge at one end 64 mm long and a face height of 43 mm. It resembles a scraping plane.

Biface Blade (Plate II, fig. 5)

The biface is ovate in shape with minimal retouch on one face. All edges possess fine secondary flaking. Length, width, and thickness measurements are 88 mm, 56 mm, and 10 mm, respectively.

Nodule Knife (Plate II, fig. 9)

This specimen was manufactured from a quartz nodule by simply flaking one edge bilaterally to produce a cutting edge 26 mm long.

Wedges (Plate II, fig. 11)

Two wedges, one of flint and the other of quartz, were recovered. Length, width and thickness measurements are 28 mm, 24 mm, 8 mm; and 19 mm, 22 mm, 9 mm, respectively. Weights are 6.1 gm and 4.6 gm.

Graver (Plate II, fig. 14)

The single graver consisted of a small flake with one edge chipped to produce a sharp projection 2 mm in length.

Paintstone

The paintstone consists of a small flat pebble of fine-grained sandstone cemented with ferric oxide.

Anvil Stone

The anvil stone is a large natural cobble measuring 128 mm by 85 mm by 55 mm. Pecked depressions occur on two faces, and one small area of an edge shows use as a hammer.

Mano

The mano is an ovate natural cobble that has been ground flat on one face from use. It measures 98 mm by 88 mm by 58 mm.

Scraping Plane (Plate II, fig. 15)

The scraping plane is actually a turtle-back core, which shows strong evidence of use-wear along the edges. Only a small portion of the dorsal surface retains any of the original quartz cobble cortex. Length, width, and height measurements are 122 mm, 69 mm, and 66 mm, respectively.

Utilized Firestone Fragment

The firestone spawl in question has been ground smooth from use along one sharp edge for a length of 89 mm. No other evidence of use or modification is apparent.

Chipping Detritus

Chipping detritus from Stratum I has the following weight in grams: quartz nodule cores 1,123.5 (31.9 per cent); quartz flakes 804.5 (22.8 per cent); flint nodule cores 641.0 (18.2 per cent); flint flakes 383.5 (10.9 per cent); quartzite core 355.0 (10.1 per cent); quartzite flakes 219.0 (6.0 per cent); and slate flake 1.0 (less than 0.1 per cent).

BONE ANALYSIS

Awls (Plate II, figs. 17 and 18)

One complete awl 64 mm long retained the articular end of the bird bone from which it was made. The remaining awl, which had been broken at the base and then reground, was made from a mammal bone and is 123 mm long.

Bird Bone Bead (Plate II, fig. 16)

This bead, which had been scored, broken, and ground at both ends, is 69 mm long and 8 mm in diameter.

Worked Antler

The single piece of worked antler had been bilaterally slotted and broken. It is regarded as rejectage.

Several other bone fragments appeared to have been worked but were too corroded to be certain.

Bone Refuse

The bone refuse is being analysed, but a preliminary impression is that the great percentage of the remains appear to pertain to fish.

SHELL ANALYSIS

Shell Refuse

The few shell fragments have been identified by Dr. A. H. Clarke, Zoology Division, National Museum of Canada, as *Lampsilis radiata siliquoidea* (Barnes), a species which occurs throughout Canada south of the tree-line.

THE NECK SITE—STRATUM II

Ceramic Analysis

Rim sherds—Rim sherd fragments from one pot and one bowl were recovered from Stratum II.

Vessel 1 (Plate III, fig. 1)

The single rim sherd from a pot possessed overall babiche impressions on both the interior and the exterior as well as on the lip. An encircling row of circular exterior punctates occurring 18 mm below the lip raises interior bosses. Punctate diameter is 6 mm, and as only one punctate occurs on the rim, the distance between punctates cannot be determined. It can be stated, however, that punctates must be more than 35 mm apart. In section, the juncture of the rim and body form an angle of nearly 95 degrees. The temper is grit, and the thickness one inch below the lip is 8 mm.

Vessel 2 (Plate III, fig. 2)

Since this vessel possesses a slightly concave interior and a convex exterior, it is regarded as a bowl rather than a pot. The exterior is covered with babiche impressions, and the interior is smooth. The lip has oblique impressions, which appear to have been done with a dentate stamp having lateral triangular teeth. The very fissile paste is grit tempered. Thickness one inch below the lip is 9 mm.

Body Sherds

There are 14 body sherds which possess both surfaces. The nine sherds with babiche impressions on both the exterior and the interior range in thickness from 6 mm to 10 mm with a mean of 7.8 mm, while the five sherds with babiche impressions on the exterior range in thickness from 4 mm to 6 mm with a mean of 5.0 mm.

Stone Analysis

Scraper (Plate III, fig. 7)

One large quartz side scraper weighing 178 gm has retouch along only one edge for a distance of 55 mm. The retouch ranges from 5 mm to 10 mm in height. The thick edge opposite the scraping face is battered considerably. Length, width, and thickness measurements are 74 mm, 70 mm, and 30 mm, respectively.

Hammerstone

The single hammerstone consists of a small natural pebble weighing 12 gm, which has been subjected to limited use on two corners.

Problematical Ground Slate (Plate III, fig. 4)

This slate flake possesses strong flat grinding along one edge while the opposite edge is crudely and erratically flaked. Natural platina occurs on one face and an end. Length, base width, and thickness are 71 mm, 33 mm, and 11 mm, respectively, and the cross-section is asymmetrically triangular.

Chipping Detritus

Chipping detritus from Stratum II has the following weight in grams: flint flakes 214.8 (58.3 per cent); flint nodule cores 139.3 (34.5 per cent); quartz flakes 44.0 (10.9 per cent); and quartzite flakes 4.8 (1.2 per cent).

Bone Analysis

Harpoon (Plate III, fig. 3)

The bone harpoon was broken at both ends. Three minute barbs (really oblique notches) are situated immediately before the major barb where the break occurs. Although the tip of the tang is missing, this portion of the artifact is 39 mm long, measured from the broken base to a scored encircling incision, which presumably functioned as an aid to lashing. The first minute barb occurs 22 mm above the scoring. The cross-section is triangular with the barbs occurring on the apex of the triangle.

Bone Refuse

Analysis of the limited bone refuse has not been completed.

Shell Analysis

The few shell fragments have been identified by Dr. A. H. Clarke of the National Museum as *Lampsilis radiata siliquoidea* (Barnes), a species that occurs throughout Canada south of the tree-line.

THE NECK SITE—STRATA I AND II—AND SURFACE

The following specimens were recovered from the disturbed slump edge of the excavation, from the areas where Stratum I and Stratum II converged into a single stratum, and from surface and tree-fall disturbances over the veneer portion of the site. In view of the time span of the site, these specimens, except in certain instances, cannot be assigned to a specific period.

Ceramic Analysis

Rim Sherds

Of the four rim sherds, two can be assigned to pots recovered from Stratum I. The remaining two rims (Plate III, fig. 5) belong to a single vessel which, on the basis of rim profile, probably consisted of a shallow bowl. The exterior is covered with babiche impressions, which also overlap the lip and the interior immediately below the lip. A row of encircling exterior punctates raises interior bosses. The exterior punctates are 5 mm below the lip, 3 mm apart, and are 4 mm in diameter. This vessel came from a tree-fall disturbance some distance from the excavations. Thickness one inch below the lip is 7 mm.

Body Sherds

All the body sherds came from the immediate area of the excavation. Of the fifteen sherds, five possess babiche impressions on both the interior and the exterior, and the remainder have smoothed-over babiche impressions on the exterior only.

STONE ANALYSIS

Hammerstones

There are four cobble hammerstones, three complete and one fragmented. The three complete specimens show evidence of use at both ends, at one end, and at one end and an edge, respectively.

Manos

The two manos consist of natural cobbles, which have been used for grinding on one face only.

Scrapers

The one complete end scraper is 95 mm long and possesses retouch at the end and along both sides. Scraper face width at the end is 47 mm, and scraper face height is 7 mm.

The end portion of another end scraper has retouch along one side as well as on the end. End scraping face width and height are 30 and 10 mm, respectively.

Knife

The single knife consists of a quartz pebble, on which one edge has been bilaterally chipped. This cutting edge is convex in outline and 36 mm long.

Reworked Pipe Bowl (Plate III, fig. 6)

Made of red catlinite, the pipe bowl has been scored, broken, and ground at the base, and both vertical edges have been ground after being vertically split. It has a height of 34 mm, an original diameter of 23 mm, and a mid-thickness of 2 mm.

Table I. FREQUENCY OF ARTIFACT CATEGORIES

	MacBride Site		Neck Site	
	Refuse deposit	Feature 1	Stratum I	Stratum II
Artifact Category	*f*	*f*	*f*	*f*
Plain bowl	7	–	–	–
Plain pot	1	–	–	–
Babiche-impressed bowl	1	–	1	1
Babiche-impressed pot	–	–	5	1
Babiche-impressed plate	–	–	1	–
Plain sherds	60	–	–	–
Babiche-impressed sherds (ext.)	–	–	309	5
Babiche impressed sherds (ext. and int.)	–	–	–	9
Side scraper	1	–	6	1
End scraper	–	3	3	–
Random scraper	–	2	–	–
Cobble scraper	–	–	1	–
Wedge	1	–	2	–
Hammerstone	1	–	6	1
Hematite—powder or nodule	P	–	P	–
Flake chisel	1	–	–	–
Scraper-knife	1	–	–	–
Chitho	–	1	–	–
Arrowhead	–	1	–	–
Biface blade	–	–	1	–
Nodule knife	–	–	1	–
Graver	–	–	1	–
Scraping plane	–	–	1	–
Anvil stone	–	–	1	–
Mano (?)	–	–	1	–
Utilized firestone	–	–	1	–
Ground slate	–	–	–	1
Bone awl	–	–	2	–
Bone bead	–	–	1	–
Worked antler	–	–	1	–
Bone harpoon	–	–	–	1
Total	74	7	345	20

OTHER SITES

There are three other sites that should be briefly mentioned before interpreting the Cree culture history in the Southern Indian Lake region. These are the Popular Narrows, the Fish Net, and the Long Point sites (Figure 1).

THE POPLAR NARROWS SITE (HeLq-1)

The Poplar Narrows site contained a veneer of material that ranged from fragments of a late Laurel tradition pot to a pair of recently discarded snowshoes. The most abundant material to be recovered, however, was Selkirk focus ceramics. Included with these ceramics was the complete bowl illustrated in Plate III, fig. 11. The bowl is ovate in outline and has smoothed-over babiche impressions on the exterior, as well as an encircling row of exterior punctates which raises interior bosses. The interior has been carefully smoothed, and the lip, although irregular, is plain except at the two ends where a series of oblique incisions occur. Length, width, and height measurements are 174 mm, 133 mm, and 40 mm, respectively. There is a wide range in thickness since the vessel has been poorly modelled, but most of the measurements, taken one inch below the lip, range from 7 mm to 8 mm. Large particles of grit temper are thinly distributed through the paste. It is inferred that a number of the rim sherds, which possess a concave interior and a convex exterior, from other sites in the area came from similarly shaped vessels. Since the various components of the Poplar Narrows site could not be separated from one another, it is not possible to suggest an accurate age estimate for the vessel. The exterior babiche impressions and the encircling exterior punctates, raising interior bosses, however, clearly assign it to the Selkirk focus. Evidence from the MacBride and Neck sites indicates that the bowl form in the Selkirk focus has a substantial time span in the Southern Indian Lake area.

THE FISH NET SITE (HeLr-4)

There are two reasons for giving the Fish Net site special mention. First, of the three rim sherds recovered, two relate to the Blackduck focus and one relates to the Selkirk focus. Second, one of the Blackduck focus rim sherds and a number of body sherds, which apparently came from the same vessel, have a poorly fired, porous, low temper paste, very similar to the plain ware from the MacBride site. In this instance, however, the exteriors are covered with smoothed-over vertical cord malleation. The rim also has short, oblique, cord-wrapped stick impressions immediately below the lip as well as similar impressions on the lip (Plate III, fig. 8). The remaining Blackduck focus rim has a row of linear stamped obliques above an encircling row of exterior punctates, which raises interior bosses, and the lip has similar oblique impressions (Plate III, fig. 9). Paste characteristics are more typical of the Blackduck focus, consisting of a well-fired paste with an abundance of grit temper. Vertical smoothed-over cord malleation occurs on the exterior of this sherd. The Selkirk focus rim is a typical form consisting of smoothed-over babiche impressions on the exterior and an encircling row of exterior punctates, which raises interior bosses (Plate III, fig. 10). Unfortunately, the Fish Net site was a veneer site, and it is, therefore, impossible to determine if the preceding vessels were associated. It is of interest, however, to see the paste characteristics of most of the MacBride site ceramics appearing on a Blackduck focus vessel. The occurrence raises the possibility that the peculiar paste in question is a local development that was applied to vessels having their major attribute origins in either the Selkirk focus or the Blackduck focus. Although several other veneer sites, particularly on Lake Opachuanau, produced ceramics made from this distinctive paste, the total absence of these paste attributes from the stratified prehistoric Neck site also raises the possibility that the paste is a late, even historic, development. At a highly speculative level it may even be suggested that the paste is a direct result of the degenerative effects of copper and iron kettles in the local ceramic tradition.

THE LONG POINT SITE (HgLo-1)

The Long Point site is a non-ceramic stratified site, from which radiocarbon samples were taken in order to determine whether or not it was pre-ceramic rather than simply non-ceramic. During the excavation of the site the available evidence suggested that a significant time depth was lacking and that the absence of pottery was fortuitous. The subsequent radiocarbon dates of A.D. 1020 ± 80 (Gak-1261) for Stratum I and A.D. 950 ± 80 (Gak-1262) for Stratum II confirmed the original impression that a significant time depth was lacking.

INTERPRETATION

The earliest historical references to the occupants of Southern Indian Lake are found in the journal of Capt. James Knight, who attempted to establish a Hudson's Bay trading post at the mouth of the Churchill River, July 14 to September 13, 1717 (Kenney 1932). The pertinent references are as follows:

> August 15th—"here came 2 Canoos of Indians down from ye great Water Lake, Although I have done all that in me lyes to keep the Indians from coming Down to this Place. they brought nothing wth them, for they had been at thee factory this Year before & Traded. I asked them wt they came here for; they told me to see whether I were here. I told them they should not trade here, but I bidd them go to Hays River factory for the time to come." (Kenney 1932, 161–162).
>
> August 16th—"the Meshinnepee Indians as came last Night, Seeing I was Dissatisfyd at their Coming here, told me I need not fear of their doeing the Northern Indians any harm by comeing here, for they Loved me and would not doo any thing as Should Dissplease me; & they beleiv'd the Northern Indians went away for fear, not seeing any of their Country people come here as was at the factory; & told me they believ'd they could not Stop any of those Indians as lives on ye North Side of ye Mishenepe Lake nor ye Northern Sinnae Poets comeing to see me If I did not lett them have Goods as likewise these Indians as Capt Swan went & made peace with, wch is the Northern Indians friends." (ibid.: 63).
>
> August 18th—"the 2 Canoos of Indians went away Up this River, wch be of the Great Water Indians as came Down 2 Days ago. I did not know Twill this Day as they had brought any thing to trade, twill one of them came to me & Asked me to trade. I told him no, I would not trade, for he must go to York fort. the fellow did Sett Silent a Little While & then he did fall into a Passion & told me I went to Starve him & said that Winter was Just comeing on he could not go there & with that took & Markt out this River & that from ye Great Water lake, where he belongs to, & said that they could come Down here in 4 Days without any Carriages. & that they cannot come from the Great Water Lake to York fort in less than 10 Days the Least, and that was sevll Great hills that way as they was forc'd to Cross wth their Canoos & Goods Upon their backs, wch makes it very Difficult to them, Especially one Carriage wch is Allmost a Days Travell for them to Carry their Bundles on their backs; & he sayth by Reason

> of the Greatness of ye Carriages makes a Great many not to come to ye factory. this is New to me & I never heard of it before as this River layd so Near that Lake before." (ibid.: 165–166)

The preceding historical reference clearly indicates not only that Southern Indian Lake was occupied by Algonkian-speakers in A.D. 1717 but that they had occupied the lake for an undetermined period prior to the record made by Knight. Equating Captain Knight's "Mishenepe Lake" or "great Water Lake" with Southern Indian Lake is emphatically supported by the last quotation, which accurately describes the portage from the southern end of Southern Indian Lake into the headwaters of the Rat River and thence via the Nelson River to the Hay River drainage to York Factory on Hudson Bay.

Within the five major subdivisions of the northern Algonkian-speakers (Jenness 1955: 266), the Meshinnepees of Southern Indian Lake are most reasonably classified under the Cree. The designation 'Cree,' however, is most definitely a classificatory device used in a somewhat arbitrary fashion to separate the small independent bands of Algonkian-speakers occupying Northern Ontario, northwestern Quebec, and central Manitoba and Saskatchewan from the related clusterings of independent bands to the south and east, referred to as Ojibwa, Algonkin, Montagnais, and Naskapi (Wright 1965).

The journal of Captain Knight gives strong support to the proposal that the MacBride site was occupied by the Cree. Cultural continuities between the historic MacBride site and the prehistoric stratified Neck site extend, via the direct historical approach, the time depth of the Cree occupation of the Southern Indian Lake region to the early 13th century or mid-8th century, depending upon which radiocarbon dates are accepted. Data from other sites in the area complement this skeletal and very incomplete framework.

Table 1 represents the occurrence of artifact categories at the MacBride and Neck sites. The MacBride site materials from the refuse deposit and Feature 1 are listed separately as there is some question regarding the contemporaneity of the two deposits. Surface finds, sherdlets, chipping detritus, and bone refuse are not listed. In terms of chronological trends, Feature 1 of the MacBride site cannot be used because of both the limited material and its questionable temporal position. The two strata from the Neck site and the historic refuse deposit from the MacBride site, however, suggest some significant trends through time. Within the ceramics, the following trends from early to late are noted: rims and body sherds with babiche impressions on both the interior and exterior are early; pot and bowl forms are present throughout the sequence, but bowls show a marked increase at the historic period; and babiche impressions, which occur on all vessels prehistorically, are practically replaced by plain surfaces at the historic period. Although the samples are small, the total prehistoric absence of plain pottery with distinctive paste characteristics would appear to be significant. It has been tentatively proposed that the plain surfaces and the new paste characteristics are more a product of the disruptive effects of European metal containers upon the local ceramic complex than the result of internal aboriginal development.

With reference to the stone assemblage, only side scrapers and hammerstones occur on all three components. Wedges and hematite in either powder or nodular form occur at the MacBride site and Stratum I of the Neck site. The remaining artifact categories are restricted to single components.

The archaeological remains from the Southern Indian Lake region appear to be the product of locally nomadic Cree families who possessed a relatively limited and simple material culture as seen by archaeology. There does not appear to be any drastic change in their culture until the historic period, when the paste and surface treatment attributes of the ceramics were markedly altered. The overall impression is of very gradual changes taking place in a semi-isolated population, which was fully exploiting the local fauna with particular emphasis upon fish. It should be pointed out, however, that the apparent emphasis on fishing may well be a bias, stemming from the virtual certainty that the archaeological sites described represent summer campsites; the winter subsistence pattern may well have been quite different from that of the summer. If one takes the difference between the two radiocarbon dates from Stratum II of the Neck site, it may then be suggested that the local cultural development began some time around the 10th century and lasted into the 18th century, when European substitutes or equivalents replaced the native material culture recognizable in the archaeological record.

The cultural development traced in the Southern Indian Lake region is apparently part of a broad culture area covering north-central Manitoba (Hlady: MS.), adjacent Saskatchewan (Downes 1938; Brown 1962; Wright 1964 survey), and adjacent Northern Ontario (K.C.A. Dawson, pers. comm.). Relatively pure Selkirk focus sites extend from Southern Indian Lake in the north to the upper portions of Lake Winnipegosis in the south, and west to Lac la Ronge, and probably further and east for an as yet undetermined distance into Northern Ontario. Within this region there is a sparse occurrence of Blackduck focus ceramics, generally found in association with the dominant Selkirk focus ceramics. An exception to this general rule is the predominantly Blackduck focus component at the Grand Rapids site on the north end of Lake Winnipeg (W. J. Mayer-Oakes, pers. comm.). The heartland of the Blackduck focus, however, appears to lie in southwestern Northern Ontario and adjacent Minnesota (Wilford 1955; Wright 1965, 1966; K. C. A. Dawson, pers. comm. and documentation). From east to west the concentrated distribution extends from the Pic River on the north shore of Lake Superior to the Lake of the Woods. The north to south distribution runs from the Lac Seul region of Northern Ontario into northern Minnesota. In this proposed heart area of the Blackduck focus there occurs a scattering of Selkirk ceramics found in association with Blackduck ceramics. Between these two heart areas, variable blending of the two ceramic traditions appears to occur. This blending is expressed in two fashions: the direct association of Selkirk sherds with Blackduck sherds and the occurrence of Selkirk and Blackduck ceramic attributes on single vessels. Southeastern Manitoba material reported on by MacNeish (1958) presents clear evidence of the ceramic blending under question. The Selkirk focus of southeastern Manitoba is characterized by the Winnipeg River Fabric-impressed wares, of which the dominant technique is babiche impressing. Similarly, the Manitoba focus, which can be equated with the Blackduck focus, is characterized by the Manitoba Corded ware where the surface finish is produced by impressing a cord-wrapped paddle into the clay. Selkirk focus and Manitoba focus components in the area always possess a percentage of each other's ware variety and, to a lesser extent, pottery types (MacNeish 1958, tab. 7, 140–141).

The two proposed heart areas of Blackduck ceramics and Selkirk ceramics actually appear to represent the geographically removed centres of the two traditions, between which there has been irregular but significant blending. In the heart areas the majority of the sites produce only a single ceramic tradition, whereas between the two heart areas the majority of the sites possess both ceramic traditions in varying abundance. An explanation presents itself for this rather extensive blending between the Selkirk and Blackduck ceramic traditions. It has generally been accepted that the Selkirk focus was basically the product of the Cree (MacNeish 1958: 67–68; Hlady MS.). The proposal that the Blackduck focus was a product of the Assiniboine (Wilford 1955: 136; MacNeish 1958: 64; Hlady 1964: 3), however, has been met with an alternate proposal that an Ojibwa authorship may be involved (Wright 1965; 1966: 90). In the light of new data I am willing to argue more emphatically for an Ojibwa–Blackduck focus association. First, the heart area of the Blackduck focus corresponds with an area of historic Ojibwa occupation. Second, the culture history of the Blackduck focus in the area is a long one, running from A.D. 950 to the historic period (ibid). Third, relatively good ethnohistoric documentation has identified the Ojibwa as being involved with the Blackduck ceramic tradition as well as other traditions (Quimby 1961; Wright 1965).

The ceramic associations and miscegenations seen between the Selkirk focus ceramics and the Blackduck focus ceramics would be readily comprehensible if the former were basically a product of the Cree and the latter were basically a product of the Ojibwa. The Cree and Ojibwa are closely related, and, indeed, it would almost certainly be an anthropologically frustrating task to attempt to differentiate a southern Cree from an adjacent northern Ojibwa. The terms 'Cree' and 'Ojibwa' are, in many respects, more imposed conveniences than ethnic realities.

A quotation from a paper that applied to a similar situation appears to offer a logical explanation for the situation seen between the Selkirk ceramics and the Blackduck ceramics:

> If one accepts the proposal that in areas of low population density exogamous patrilocal bands frequently acquire women from a considerable distance resulting in a stable male culture and a mobile female culture (McPherron 1965; Owen 1965; and Dietz 1965), then a plausible explanation for the archaeological situation apparent along the north shores of the Upper Great Lakes presents itself. As pottery manufacturing is a trait of female culture, the mixture of ceramic traditions may be simply a reflection of female mobility in response to patrilocal residence requirements. (Wright, In press *a*.)

Although I regard the Selkirk focus as being basically Cree and the Blackduck focus as being basically Ojibwa, the application of these terms are fraught with pit-falls, and it would be better, in some respects, to designate the various archaeological assemblages as 'Boreal Forest Algonkians' and 'Great Lakes – St. Lawrence Algonkians' after the forest classification.

However, any device that attempts to classify the small bands of northern Algonkian-speakers will probably encounter difficulty. To further compound the situation it is apparent that not all Cree were Selkirk ceramic users any more than not all Ojibwa were Blackduck ceramic users. Although a substantial amount of archaeological survey and excavation in the Lake Mistassini and Lake Albanel region of central Quebec (Rogers and Rogers 1948, 1950) has failed to produce any ceramics, yet the area was historically occupied by the Cree. The Lac au Goeland region further to the west in Quebec and Lake Abitibi, straddling Quebec and Ontario, have contact archaeological sites producing a mixture of Ontario Iroquois tradition ceramics and Blackduck focus ceramics (Rogers and Bradley 1953; Ridley 1958, 1966; Lee 1965; and Wright, In press *b*). In terms of the historical record, both these regions could be attributed to the Cree or Cree-Algonkin.

At the present very preliminary stage of investigation, it would appear that the various bands of the Cree could have been using Selkirk ceramics, Selkirk and Blackduck ceramics, Blackduck ceramics, Blackduck and Iroquois ceramics, Iroquois ceramics, or no ceramics, depending upon their geographical location. Under these circumstances it may well develop that the lithic assemblage and not the ceramic complex will become the basic tool for indicating the broad spatial relationships suggested by language and culture.

It is relatively clear that the ethnic designations derived from ethnology and history will never equate neatly with the archaeological reconstructions. On the other hand, it may be possible for the archaeologist to assist the ethnologist, the ethnohistorian, and the historian by tracing the time depth of local sequences and by presenting the evidence for broad areas of interaction between the various bands of the northern Algonkian-speakers. It is anticipated that reciprocal data from the other disciplines will result in a much more meaningful picture of the culture history of the northern Algonkians than currently exists.

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PLATE I

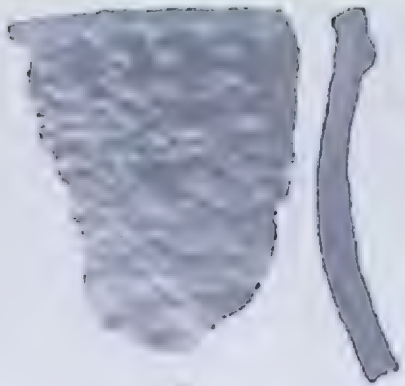
(½ natural size)

MacBride Site

Fig.

1—Vessel 1
2—Vessel 2
3—Vessel 5
4—Vessel 4
5—Vessel 10
6—Chitho
7—Flake chisel
8—Problematical scraper-knife
9—Wedge
10—Arrowhead
11—Side scraper
12—End scraper
13—End scraper with possible burin at opposite end from scraping face
14—Flattened lead musket ball
15—Glass bead
16—Copper rectangle

PLATE I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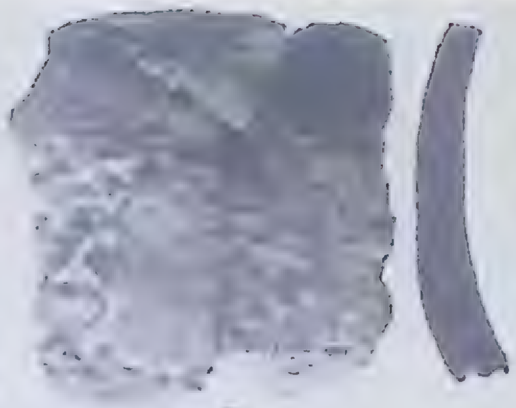
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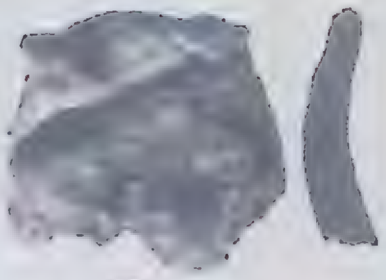
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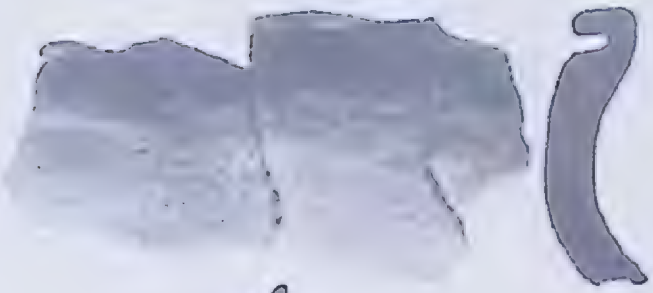
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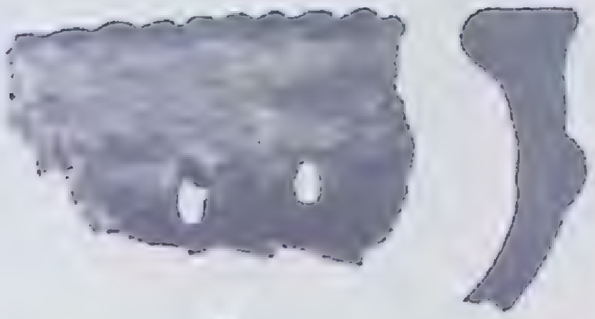
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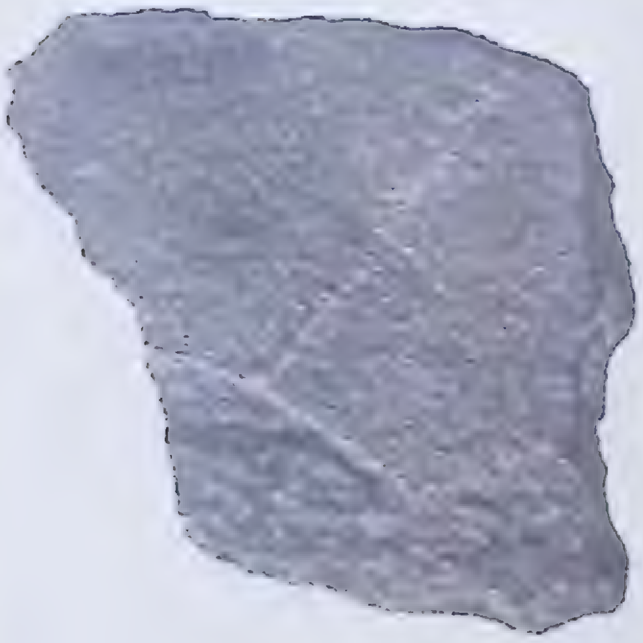
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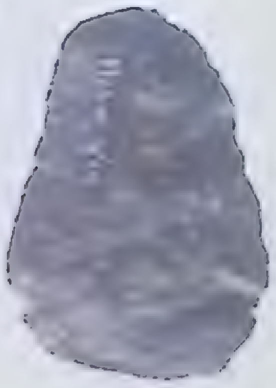
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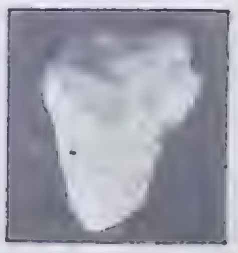
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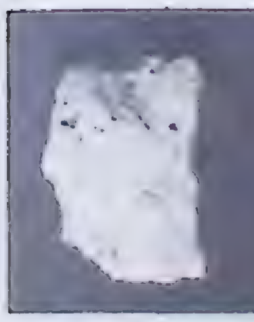
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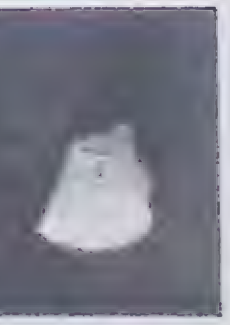
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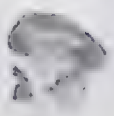
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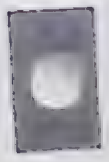
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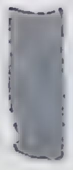
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PLATE II

(½ natural size)

Neck Site—Stratum I

Fig.

1—Vessel 3
2—Vessel 2
3—Vessel 7
4—Vessel 6
5—Biface blade
6—Side scraper
7—Babiche-impressed body sherd
8—Plasticene impression taken from fig. 7
9—Nodule knife
10—Side scraper
11—Wedge
12—End scraper with projecting burin
13—End scraper
14—Graver
15—Scraping plane (lateral view)
16—Bird bone bead
17, 18—Bone awls

PLATE II

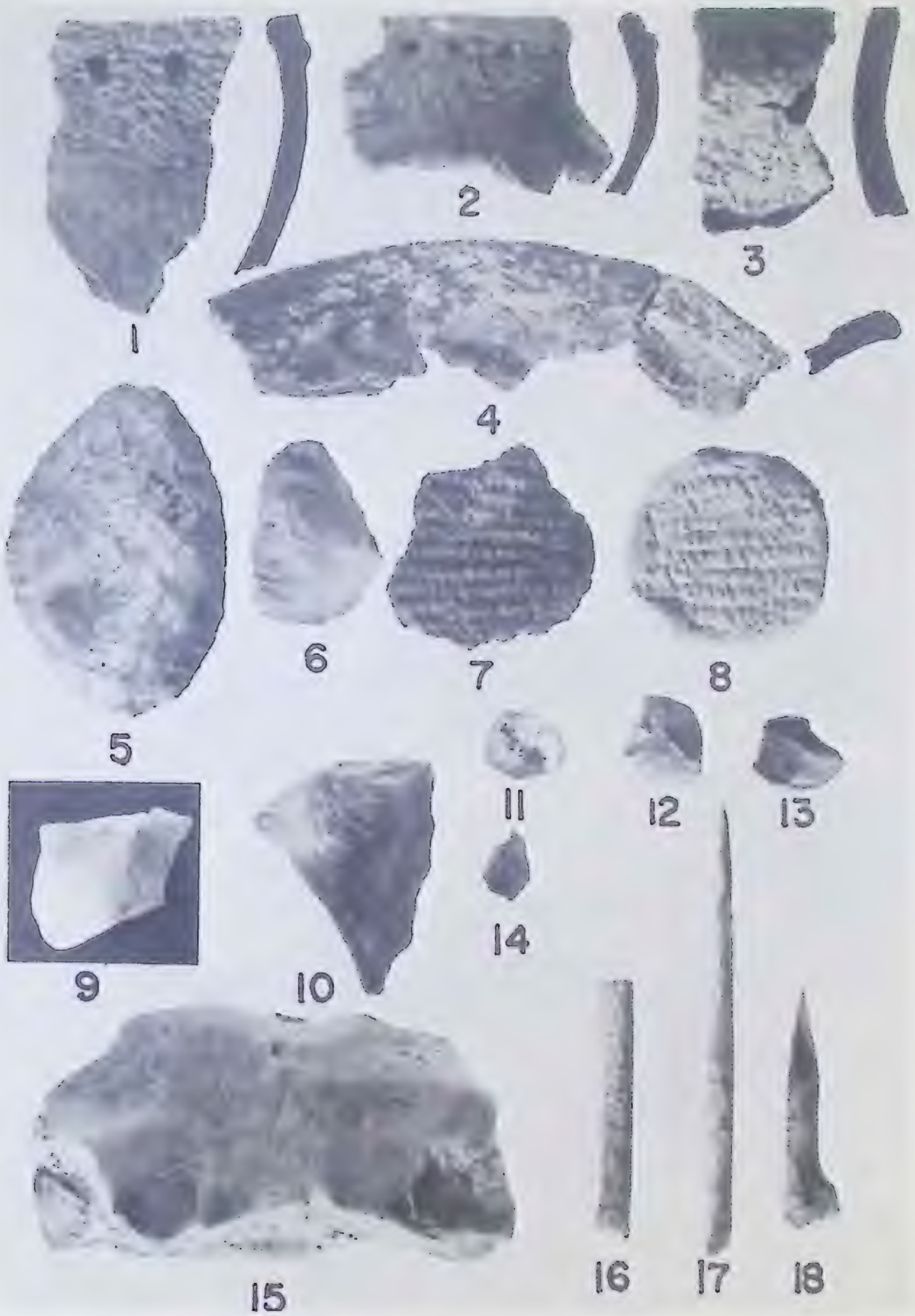


PLATE III

(½ natural size)

Neck Site—Stratum II

Fig.

1—Vessel 1
2—Vessel 2
3—Bone harpoon
4—Problematical ground slate
7—Side scraper

Neck Site—Surface

Fig.

5—Vessel 1
6—Reworked catlinite pipe bowl

Fish Net Site

Fig.

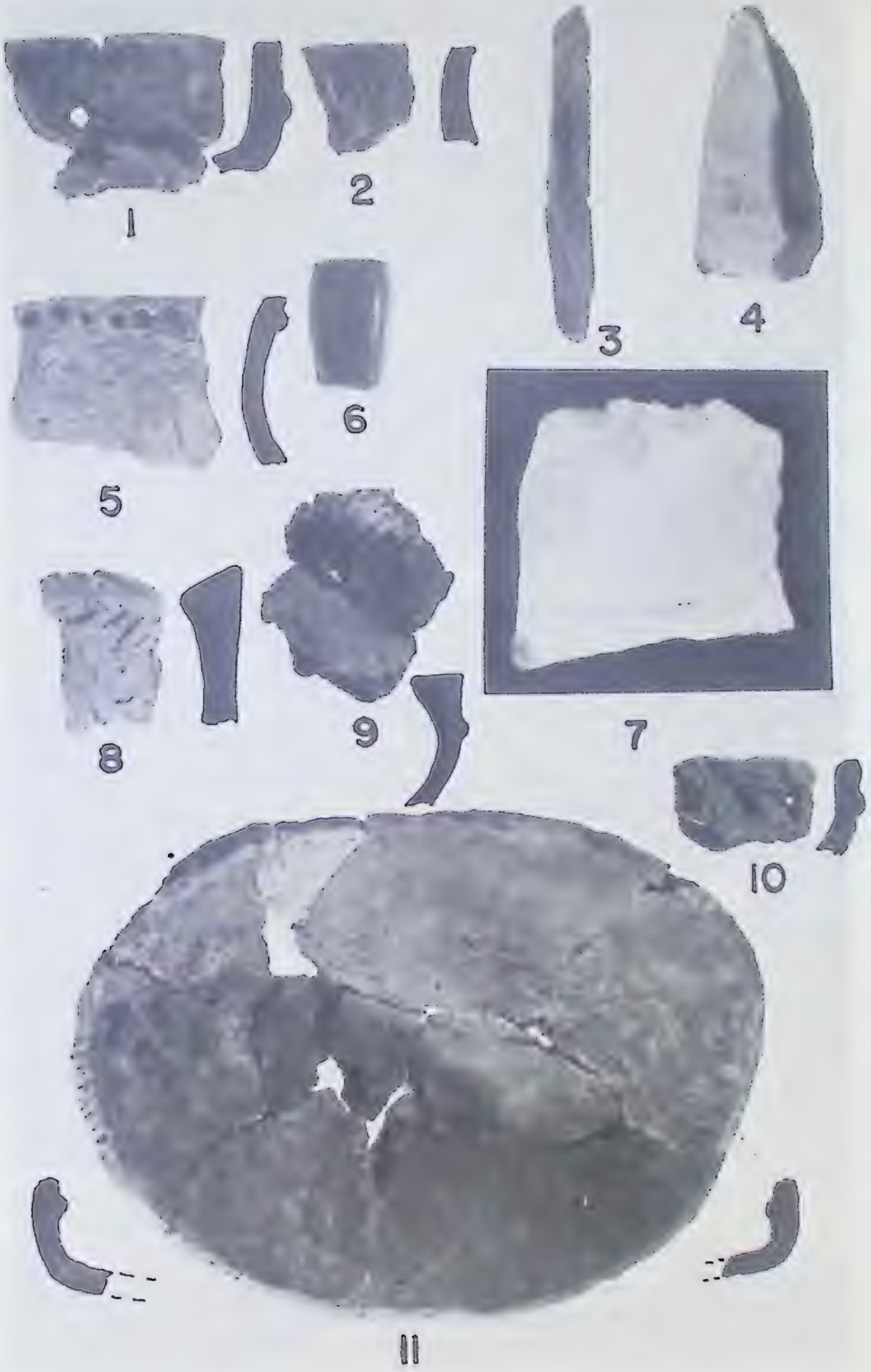
8, 9—Blackduck focus rims
10—Selkirk focus rim

Poplar Narrows Site

Fig.

11—Reconstructed bowl

PLATE III



THE ARCHAEOLOGY OF THE FOSSIL BAY SITE, SUCIA ISLAND, NORTHWESTERN WASHINGTON STATE, IN RELATION TO THE FRASER DELTA SEQUENCE

BY R. S. KIDD

RÉSUMÉ

L'île Sucia est située près de la frontière canadienne, dans la partie la plus septentrionale des îles américaines San Juan. Les fouilles qui ont été effectuées au gisement de Fossil Bay, l'un des monticules de coquillages de la petite île, ont mis au jour deux collections archéologiques distinctes. La première collection (apparemment la plus ancienne) était associée à un amas de coquillages reposant sur d'autres débris, dans la localité A (nord) du gisement, et à la couche plus basse, principalement sableuse, de la localité B (sud). Elle se caractérise par des objets façonnés en pierre taillée, notamment des pointes de projectiles, et par d'autres façonnés en pierre adoucie tels que labrets, perles en schiste et une pointe en ardoise. En cela et à d'autres égards, la collection ressemble aux objets de la phase Marpole du delta du Fraser, qui s'étend approximativement de l'an 400 av. J.-C. à l'an 200 de notre ère. L'amas assez épais, et en grande partie sans coquillages, de la localité A est presque identique à une situation stratigraphique retrouvée ailleurs dans les îles San Juan et sur la terre ferme de l'État de Washington, mais son interprétation est difficile.

La seconde collection (apparemment plus récente) était associée aux couches supérieures de l'amas de coquillages dans la localité B (sud) du gisement de Fossil Bay. Presque totalement dépourvue de pierre taillée, elle se caractérise par des valves de harpon faites de deux pièces en bois de cervidés, ainsi que par de petites pointes en os non barbelées et une assez grande quantité de restes de mammifères, d'oiseaux et de poissons. Elle ressemble à la phase avancée des Indiens Salish de la côte habitant le delta du Fraser, qui remonte à environ 1300 ap. J.-C., et à la phase San Juan des îles San Juan. A quelques différences près, elle rappelle la culture matérielle et l'orientation économique des Indiens Salish de la côte, bien que la date déterminée par la teneur en carbone 14 soit d'environ 436 ap. J.-C., donc antérieure à l'autre.

A compter de la phase Marpole, certains traits caractéristiques de l'évolution culturelle des habitants du delta du Fraser semblent avoir été partagés, peut-être de façon marginale toutefois, par des éléments établis dans ce qui est à peu près le tiers nord de la partie ouest de l'État de Washington. Plusieurs éléments ressemblant à ceux de la phase Marpole ont été étudiés dans les îles San Juan. Plus loin au sud et au sud-est, cependant, ces traits disparaissent pratiquement pour être remplacés par plusieurs éléments d'un caractère différent et présentant des affinités avec les tribus du plateau ou de l'intérieur. Les différences archéologiques entre les deux régions semblent se refléter dans des particularités linguistiques et d'autres caractéristiques ethnographiques.

SUMMARY

Sucia Island is located near the Canadian border in the northernmost American San Juan Islands. Excavations at the Fossil Bay site, which is one of several shell mounds on the small island, yielded two distinct archaeological assemblages. The first, and apparently earlier assemblage was associated with shell and underlying non-shell midden in the northern Locality A of the site and with the lower, mostly sandy stratum of the southern Locality B. It is characterized by chipped stone artifacts, notably projectile points, and by ground stone artifacts such as labrets, shale beads, and a slate point. In these and other respects, the assemblage resembles the Marpole phase in the Fraser River Delta, which dates between approximately 400 B.C. and A.D. 200. The fairly thick, largely shell-free midden in Locality A nearly duplicates a stratigraphic situation noted elsewhere in the San Juan Islands and on the Washington mainland, but it is difficult to interpret.

The second, and apparently later assemblage was associated with upper shell-midden strata in the southern Locality B, Fossil Bay site. Almost entirely lacking in chipped stone, it is characterized by composite harpoon valves of antler, small unbarbed bone points, and fairly abundant remains of mammal, bird, and fish. It resembles the Developed Coast Salish phase in the Fraser Delta, which has one date of approximately A.D. 1300, and the San Juan phase in the San Juan Islands. With some qualifications, it suggests the material culture and economic orientation of the ethnographic Coast Salish Indians, despite a relatively early carbon-14 date of approximately A.D. 436.

From Marpole time on, certain traits diagnostic of cultural developments in the Fraser Delta seem to have been shared, though perhaps in a marginal sense, by components in approximately the northern third of western Washington State. Several components resembling Marpole have been described from the San Juan Islands. Farther to the south and southeast, however, these traits virtually disappear, and several components of different character and of apparent Plateau or interior affinity occur. Archaeological differences between the two areas appear to be reflected in linguistic and other ethnographic differences.

INTRODUCTION

The American San Juan Islands occupy an area approximately 33 miles long by 27 miles wide. They are bounded on the south by Washington Sound and the Straits of Juan de Fuca, on the east by Rosario Strait, and on the north by the Gulf of Georgia. The major islands are bounded on the west by Haro Strait and Boundary Pass (McLellan 1927: 15, 21–2).

The larger islands, such as Orcas, are characterized by a rough topography, a deeply indented shoreline, and precipitous sea bluffs rising from the water's edge of narrow inlets. Among the hills and rock outcrops are shallow valleys and basins and small bench lands (Mangum 1912: 10–11; McLellan 1927: 22). The maritime climate is characterized by even temperatures and prevailing westerly winds; precipitation is greatest in winter (Mangum 1912: 29). Many of the islands are heavily wooded, although there is relatively little rainfall because they are in the precipitation shadow of the Olympic Mountains (McLellan 1927: 89–90).

Sucia Island is approximately two miles north of Orcas Island (the largest of the group), between lat. 48°44′ and 48°46′ N., and long. 122°52′ and 122°56′ W. It lies near the juncture of Haro and Georgia straits, less than five miles from the Canadian border (Figure 1). The island is approximately two miles long by one and one-half miles wide, and consists of Upper Cretaceous layers, richly fossiliferous in some localities, which are folded in a syncline that dips to the southeast (Weaver 1916: 77, 254; Breitsprecher 1962: 7). The alternation of the bands of harder conglomerate and arkose with softer shale, or sandstone and siltstone, has resulted in extreme differential erosion by glacial ice and water and a deeply embayed coastline (Weaver 1916: 78; McLellan 1927: 71; Eke 1959; Breitsprecher 1962: 7). Deep bays or drift-covered valleys alternate with narrow ridges to form

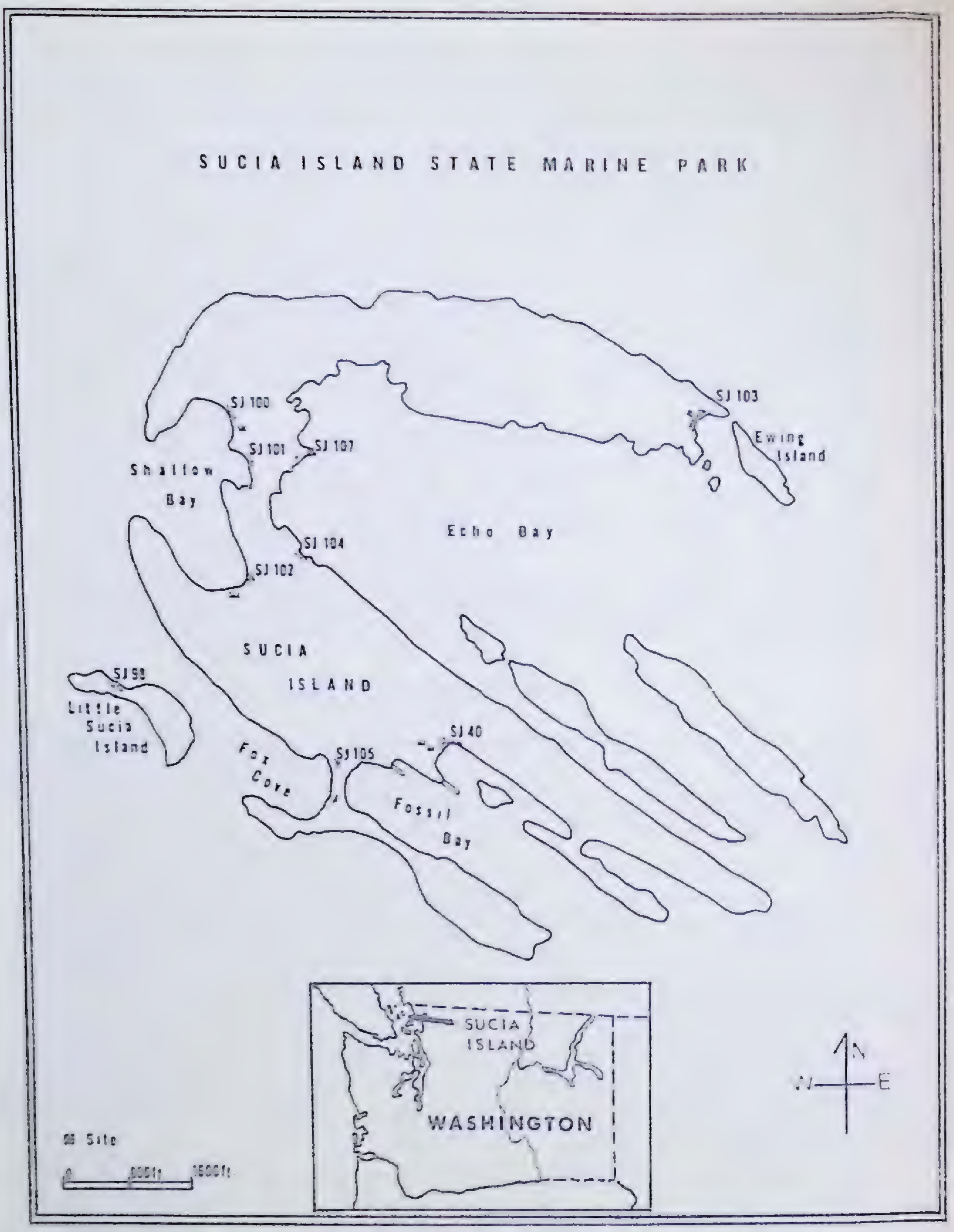
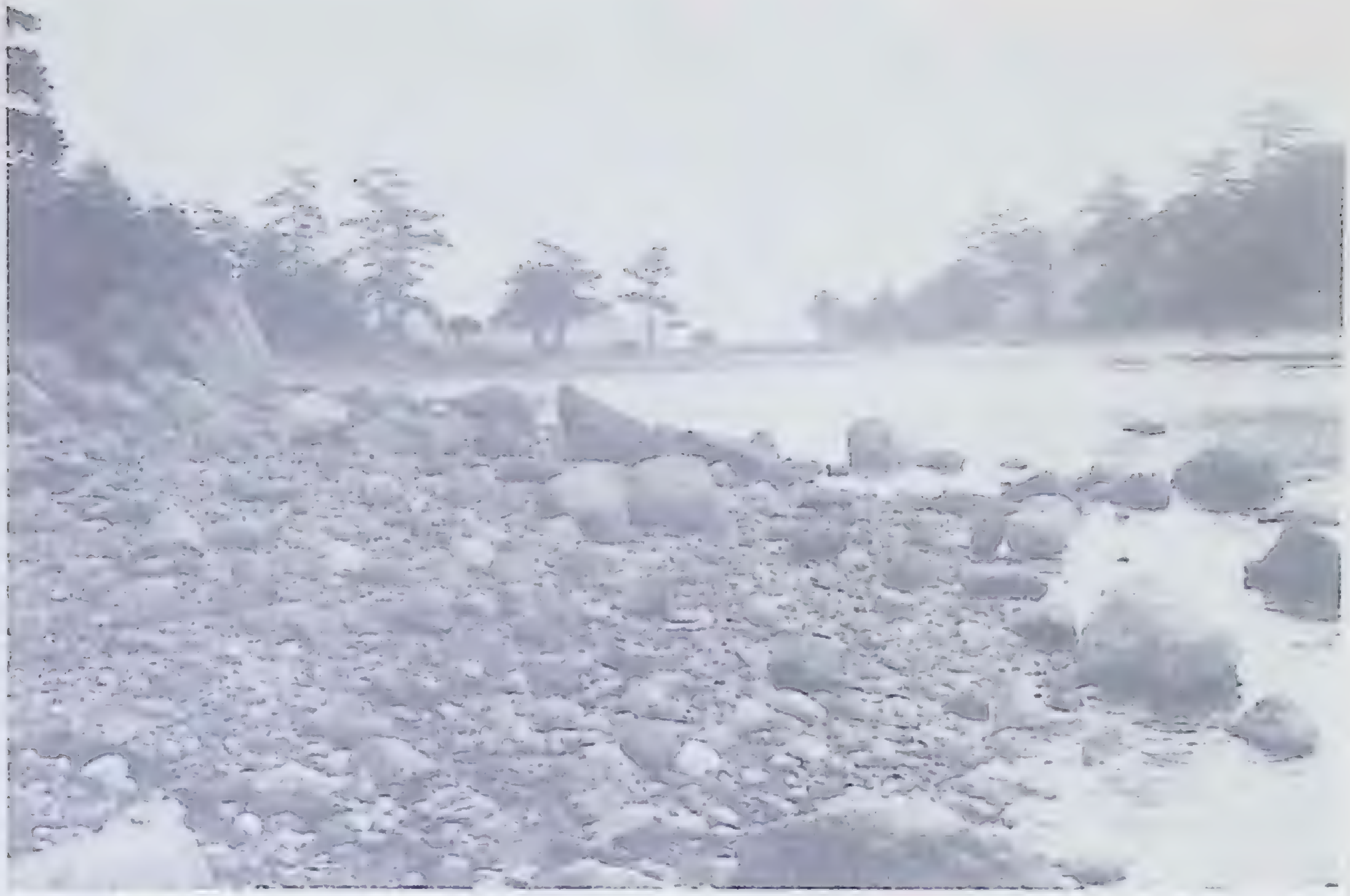


FIGURE 1—*Map of Sucia Island State Marine Park showing locations of archaeological sites*

elongated fingers, either as separate islands or peninsulas, arranged on the plan of a horseshoe and having a total area of 749 acres (McLellan 1927: 70–72). There are no streams, but well water is presently available on the island.

At least eight Indian shell middens are located on Sucia Island; most of them are on the narrow necks of low, swampy ground separating the bays.



The Fossil Bay site (45SJ105) view to east–southeast. Fox Cove in foreground, Locality A in left, Locality D in centre, and Locality B in right background.

In 1960, several of these sites had already been seriously disturbed, but five of them (45SJ40, 45SJ98, 45SJ100, 45SJ101, 45SJ105) appeared to warrant testing (Figure 1).

THE FOSSIL BAY SITE, 45SJ105

The major occupation site on Sucia Island appears to have been 45SJ105 (Washington State, San Juan County, Site No. 105), located at the head of Fox Cove and extending to and along the west shore of Fossil Bay (Figure 1 and Plates I, II). This shell midden is over 250 metres in length and 30 metres in width and has a maximum depth of more than 2.5 metres. Four localities were distinguished.

Locality A is a distinct mound north of the low isthmus separating Fossil Bay and Fox Cove (Plates II, III, IV). It abuts on high, extensively quarried, sandstone bluffs and is partially covered by quarry tailings. Patches of midden follow the shore of Fossil Bay to the northeast. To the north, as it approaches the bluffs, the mound deepens; to the south it slopes down into a low area apparently continuous with Locality D.

Locality B is a shell mound to the south of the isthmus and approximately 100 metres from Locality A (Plates I, V). It commences where the ground begins to rise to form the spine of a peninsula. The mound runs southerly along the western base of this ridge, which forms a sheltered shelf

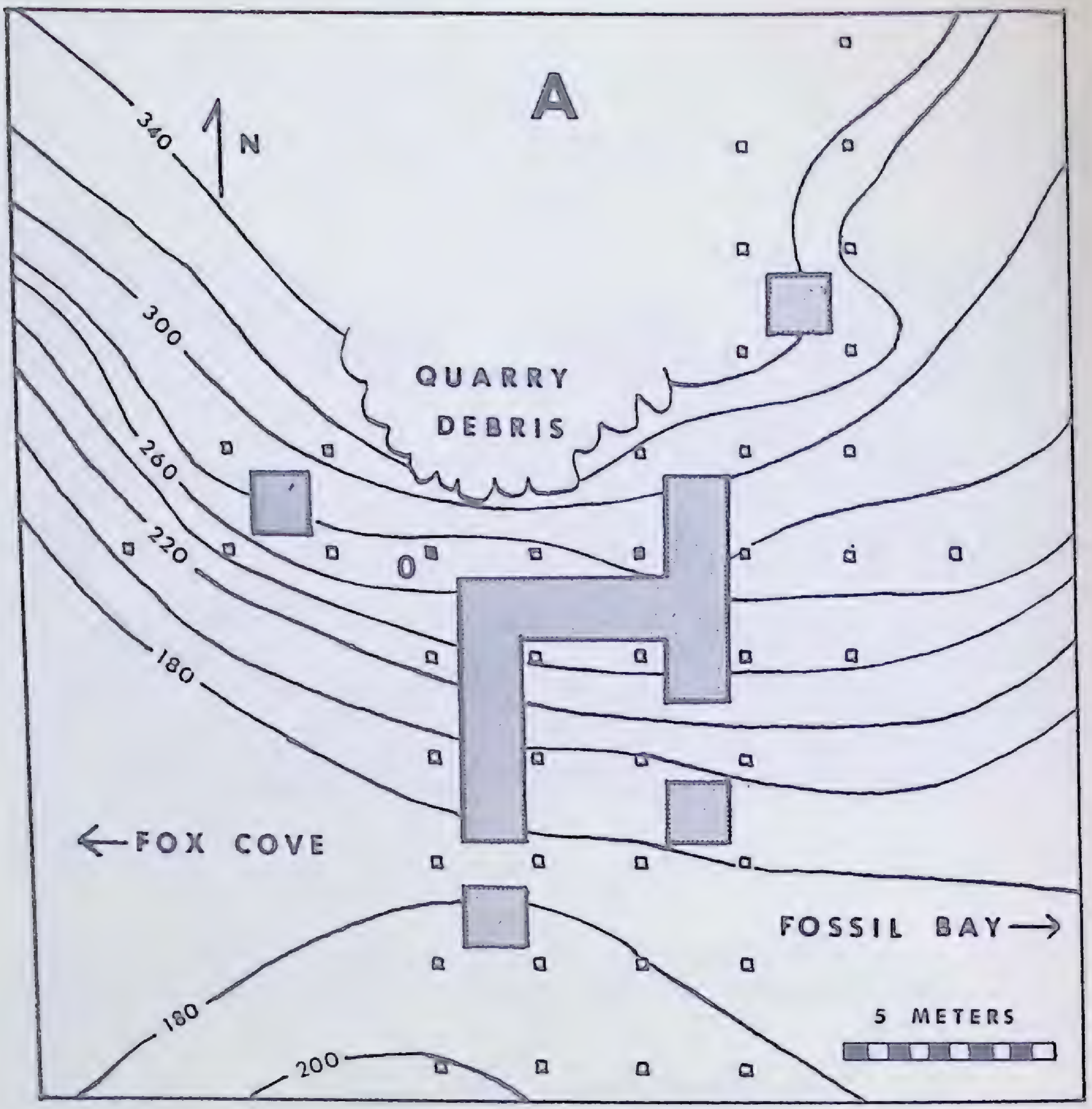


FIGURE 2—*Sketch of site 45SJ105, Fossil Bay Locality A.* The excavation grid and approximate topography are shown. Contour intervals are 20 cm, and sea-level is estimated.

above the Fox Cove beach. Near the northern end of this shelf is a slight depression that may have been occupied by an aboriginal house. To the south, the midden continues through thick brush, and traces appear to the edge of a second narrow isthmus. Vegetation is heavy on both the A and B middens and consists notably of Douglas fir (*Pseudotsuga taxifolia*), western red cedar (*Thuja plicata*), snowberry (*Symphoricarpos albus*), and wild rose (*Rosa nutkana*).

Locality C lies beyond the isthmus on the south end of Locality B, where the land slopes upward to the west to form bluffs. Scattered along the south face of these bluffs are thin patches of shell midden. Near the base of the slope, an uprooted tree revealed shells and a large abrasive stone. Farther up the slope all signs of occupation cease.

Fossil Bay site, view to the north–northwest. Fossil Bay in right foreground, Locality A in approximate centre background, quarried sandstone bluff and field camp in right background.

Locality D denotes the flat area between Localities A and B (Plate I). It appears to consist of a light shell midden, 86 cm deep in the centre of the clearing, overlying beach sand. Scattered over this flat area are a number of shallow circular depressions several metres in diameter, which may be the remains of aboriginal house or clam-baking pits. They may however result from the uprooting of large trees, several of which still grow along the beach. Locality A, and probably Locality D, were occupied by a house and small farm at least during the 1880's. Locality D was recently developed for use as a picnic ground.

EXCAVATION AND STRATIFICATION

Excavation was carried out in Localities A and B of the Fossil Bay site. A datum point was established at the top of a concrete post 40 cm high approximately in the centre of Locality D. The grids were delineated by stakes set at 2.5-metre intervals and are sketched in Figures 2 and 4. Separate grids were established on the two excavated localities, with stakes designated according to distance and direction from an arbitrarily chosen '0' point. Eventually these grids were tied in to the datum point. Trenches were generally 1.5 metres wide and were excavated largely with shovel and bucket. Most of the material was screened through one-quarter-inch mesh. Arbitrary levels of 20 cm were measured from nearest ground surface, but stratigraphic divisions were noted wherever these were recognizable. A

Fossil Bay site, Locality A, looking northeast, completed trenches

Fossil Bay site, Locality A. Stratification of north wall, main east–west trench (along 0.5 metre south line—see Figure 3). Feature A 1 is shown in lower right-hand corner.

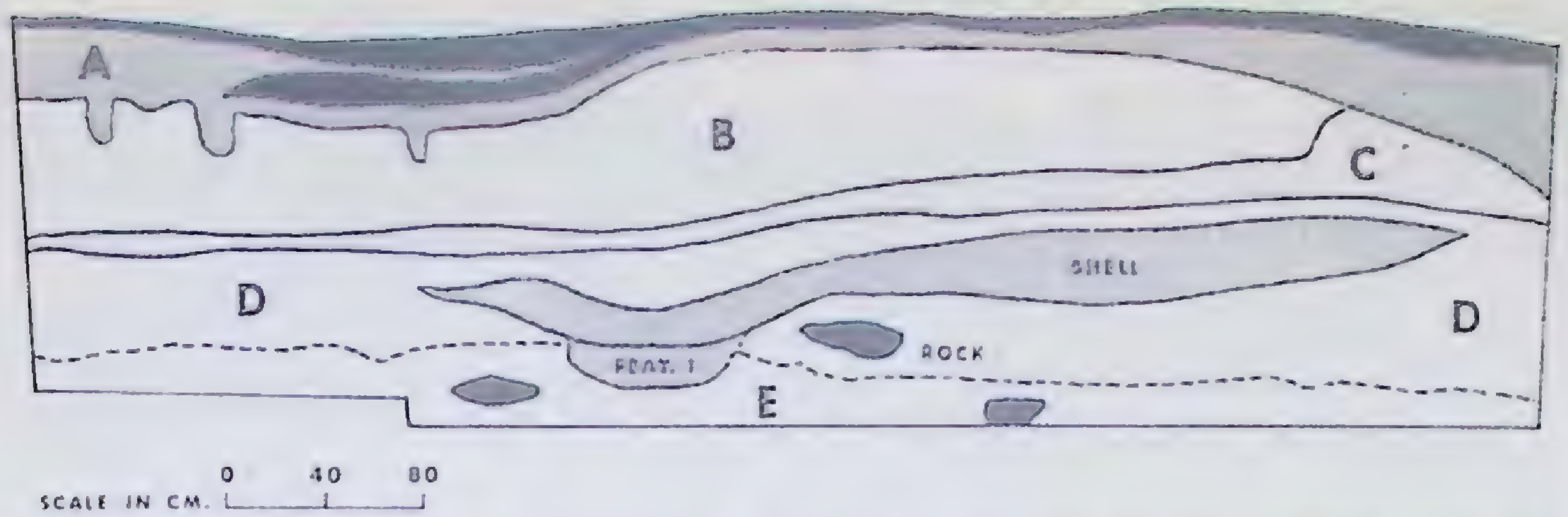


FIGURE 3—*Fossil Bay site, Locality A.* Drawing of stratigraphic profile along 0.5 metre south line between 0.5 metre east and 7 metres east (North wall of main east–west trench shown in Figure 2). Lettered strata correspond to description in Table 1.

virtually complete cross-section of Locality B was obtained. At Locality A, excavations were made in the deeper as well as the shallower portions of the mound and in the low area to the south.

Typical sequences of strata are indicated in Figures 3 and 5 and in Tables 1 and 2, lettered from surface down; the thickness of layers varied considerably throughout the excavations. Stratum letters have no reference to soil horizons.

TABLE 1—TYPICAL STRATIGRAPHIC SEQUENCE AT LOCALITY A

Stratum	Description	Thickness *cm*
A	Humus and rootlets underlain by dark grey soil, shell, ash, and green sea urchin spines. Containing near the surface glass, wire, metal scraps, and a lead bullet	15–50
B	Largely fragmentary shell of many species, mixed with light brown, ashy fill	up to 65
C	Finely fragmented and compacted purple shell, chiefly edible mussel	5–10
D	Sand and gravel shading from dark grey-brown into dark brown, light brown, and yellow, and becoming coarser with depth. Embodying a 10 to 20 cm thick shell lens, consisting almost entirely of butter clam	40–60
E	Sterile sand with beach pebbles, light brown to yellow, and increasing in coarseness with depth. Containing shell at a depth of 145 cm, wood and blue mud at a depth of 250 cm	350 in auger test
F	Rock	–

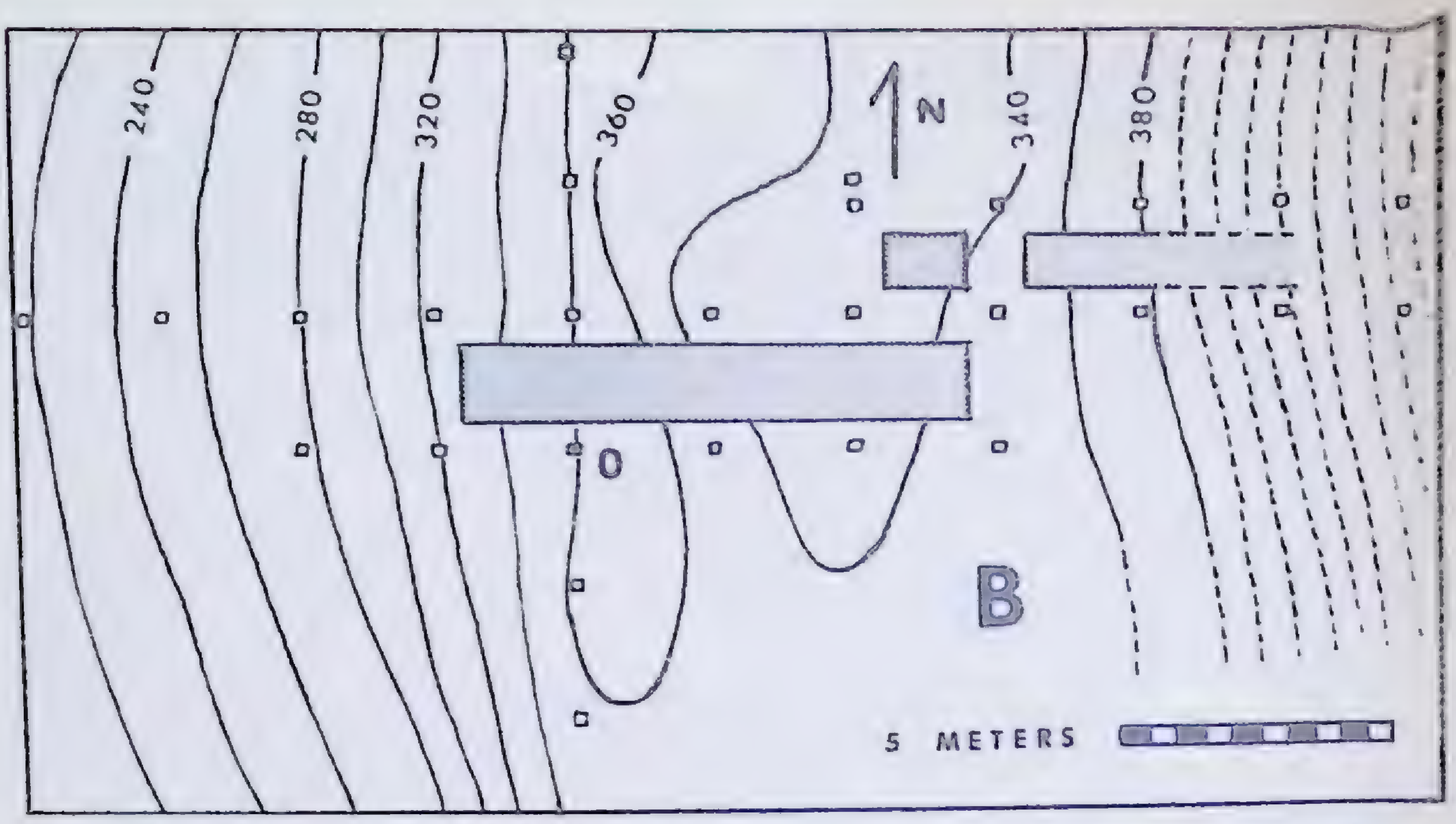


FIGURE 4—*Sketch of site 45SJ105 Fossil Bay, Locality B.* The excavation grid and approximate topography are shown. Contour intervals are 20 cm, and sea-level is estimated. Fox Cove is to left of map area.

TABLE 2—TYPICAL STRATIGRAPHIC SEQUENCE AT LOCALITY B

Stratum	Description	Thickness *cm*
A	Humus with brown ash pockets. Metal	4–10
B	Dark grey shell midden, with abundant green and purple sea urchin spines, fish bones, and ash lenses	100–140
C	Charcoal-bearing sand lenses, separated by water-laid sand and rolled shell. Exposed on the east side of the midden, the lenses disappear towards the beach	up to 70
D	Sterile sand, grey-brown to olive in colour, containing rolled shell fragments	77–126
E	Bedrock, a blue-green sandstone sloping down steeply toward the cove	–

Stratification, then, differed significantly in the two localities. In Locality A, fill underlying the midden consisted of sand and pebbles and seemed to have attained a degree of stabilization before the first occupation. But in Locality B the initial deposit was a loose beach sand and small gravel, mixed with lenses of water-rolled shell. The earliest occupants of this sector may have camped on a fairly unstable beach, perhaps washed by winter storms between seasonal occupations. Apparently undisturbed charcoal and a concentration of fire-cracked stone in the eastern part of the mound may

Fossil Bay site. Locality B, Main east–west trench, looking east

have been preserved by their proximity to the ridge. Stratification suggests increasing stability through time and the eventual development of forest.

The earliest cultural layer in Locality A (Stratum D) may constitute a house floor underlying a shell midden. However, the fact that it extended throughout the entire area excavated suggests that it represents more than a single structural feature. With the exception of a thick lens consisting almost entirely of *Saxidomus giganteus* (butter clam), only traces of fragmentary shell were present. Included in Stratum D were a large number of milky quartz chips, none of which showed positive human workmanship. Although quartz nodules are readily obtained from conglomerates on the southern part of Sucia Island, very few quartz chips were recovered from the B stratum of Locality A or from Locality B.

Stratum D was separated from overlying deposits by a stained sand, possibly suggesting a period of humus formation, and by a thin, compact deposit of fragmentary mussel shell. Unlike previous inhabitants, those who laid down Stratum B seem to have utilized most of the shellfish resources available on the island. The homogeneity of this thick deposit would almost suggest that it accumulated during a single protracted occupation. The entire stratum disappeared to the south of the mound, where mixed shell and dark soil were imposed directly on a dark grey, shell-free midden.

The later fill of Locality B consisted of a thick relatively homogeneous shell midden also.

Differentiation of locality and strata, combined with an analysis of the artifacts, suggests that three components may occur at the Fossil Bay site, representing two distinct phases defined elsewhere in the Pacific Northwest. Specimens and features from Locality A and from Stratum C of Locality B compare with those of the Marpole phase in the Fraser Delta (Borden 1950: 18–19; 1962: 12, Plates 2, 5) and of the Marpole phase as defined on the larger San Juan Islands (Carlson 1960: 563–70). Since these two assemblages

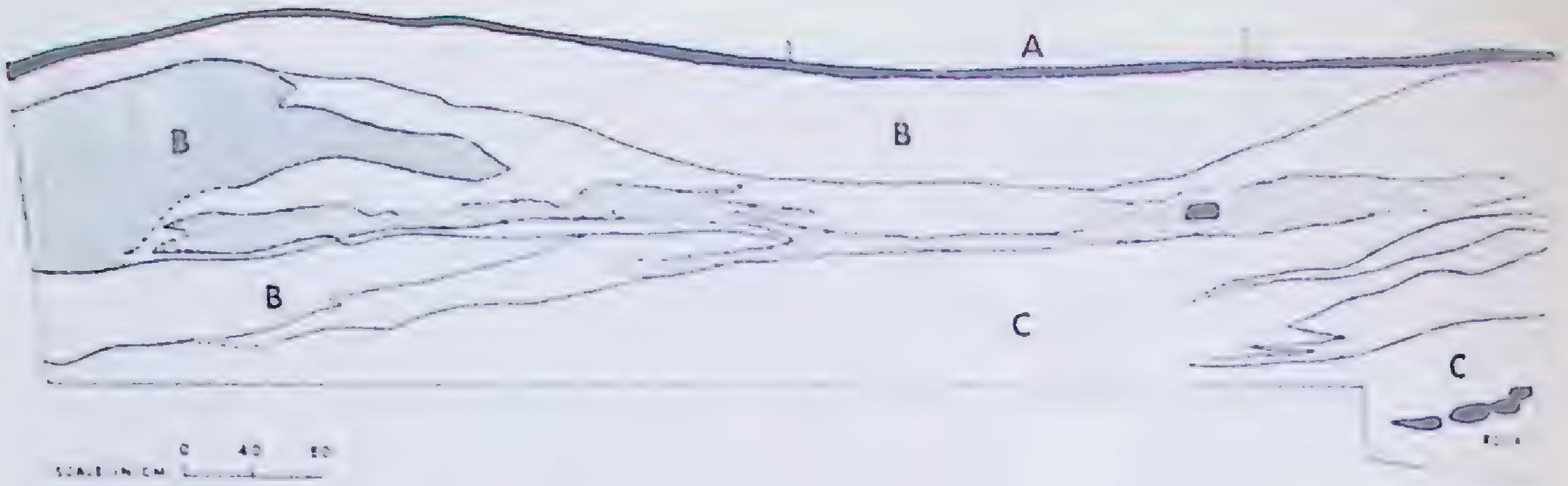


FIGURE 5—*Fossil Bay site, Locality B.* Drawing of stratigraphic profile along 2 metres north line between 2 metres west and 7 metres east (north wall of southern trench shown in Figure 4). Part of Feature B is shown in lower right-hand corner. Lettered strata correspond to description in Table 2.

from Sucia Island, the second of which is very small, are separated spatially, and since their relationship with a single phase is hypothetical, they are treated here as two components rather than as a single component. Specimens from Strata A and B in Locality B compare closely with materials from Carlson's San Juan phase (Carlson 1960: 576–82) and, to a lesser extent, with those of the Developed Coast Salish phase at Stselax Village, Musqueam, in the Fraser Delta (Borden 1950: 17–18; pers. comm.).

EARLY COMPONENTS, FEATURES

Feature A 1 was a pit intruding from the base of Stratum D of Locality A into the virtually sterile subsoil of Stratum E (Figure 3 and Plate IV). This pit was oval in outline, centred approximately 314 cm east and 94 cm south of point '0' (Figure 2), and lay between 120 and 150 cm below ground surface. Probably less than one-third of the feature remained unexposed. The dimensions of the exposed portion were 90 cm along the north–south axis and 87 cm along the east–west axis. Sandstone blocks occurred within 20 or 30 cm to the east and to the west of this pit, suggesting an arrangement comparable to Feature B 1. Pit fill consisted of the D matrix, with broken (perhaps fire-cracked) rocks and pebbles concentrated toward the centre, and one amorphous flake of chipped basalt. The lens of butter-clam shell dipped into this depression (Figure 3 and Plate IV).

Feature B 1 consisted of a single layer of approximately fist-sized, water-rounded pebbles, many of them apparently fire-cracked, overlying compacted powder charcoal and sand. It was located in the lowermost cultural stratum of Locality B, approximately 24 cm above bedrock, 22 cm below a thin lens of charcoal, 56 cm below the top of Stratum C, and 210 cm below ground surface. It was centred approximately 155 cm north and 615 cm east of point '0' (Figure 4), and measured 52 cm north–south and 60 cm east–west. Large sandstone blocks appeared to encircle the stone concentration and to rest on or near a reddish discoloured sand, but these blocks (Figure 5) could not be entirely exposed in the time available. Possibly the fire-cracked stone may represent the residue of stone boiling rather than a hearth.

EARLY COMPONENT ARTIFACTS

Table 3 lists the quantity, size range, and provenience (if known) of specimens from the early components. Weights are in grams, and measurements are in millimetres. Provenience is largely established on the basis of the stratum entries in the field catalogue, checked against a partly satisfactory correlation of level records with strata diagrams. Quantity of specimens in a given stratum is generally too small to be significant.

CHIPPED STONE

Cores and Flakes

The early components are characterized by a relative abundance of chipped stone, almost entirely basaltic. Many specimens consist of irregular nodules or flakes. Eight of these are tentatively identified as cores, exhibiting one or more rough striking platforms from which a few short, irregular flakes have been detached. Two large oval flakes of slaty stone and five small basalt flakes appear to have been used. A large number of milky quartz chips may also have been used, although no positive indications could be seen.

Irregular Scrapers

One large specimen is made from a thick, blade-like flake, triangular in cross-section, with unifacial retouch or heavy use along one side. Twelve smaller unifacially worked flakes range widely in outline but are approximately triangular to rectangular. Cross-section is irregular. Retouch occurs along only one side. Workmanship is extremely rough, and the flaking angle ranges widely.

Ovoid Scrapers

One specimen appears to have been purposely shaped to a generally oval outline, as well as having been retouched; two others may have been similarly modified. The most regular specimen (Plate VI, fig. g) is approximately plano-convex in section, with flaking and slight serration on one convex side, and perhaps one end. It may be a broken end-scraper.

Flake Knives

Six specimens are irregular in outline (approximately rectangular or triangular) and section but are retouched bifacially along one side to form a thin cutting edge. One of these examples is retouched on two adjacent sides of an approximately rectangular flake, but it may be the fragment of a large pointed knife.

Chipped Slate Knife

Although apparently broken, this specimen of slaty stone appears to have been pear-shaped in outline. Its section is thin but slightly plano-convex. Retouch, sometimes unifacial, sometimes bifacial, which extends aroun the periphery, is concentrated at the larger end.

Bifacial, Bilateral Knives

Generally rectangular, but irregular in outline and crude in workmanship, three flakes have been bifacially and bilaterally worked, probably by percussion. Their transverse sections are slightly concavo-convex.

Lanceolate Projectile Points

One specimen (Plate VI, fig. a) is asymmetrically convex-sided, with the widest point approximately one-third the distance from base to tip. The base is slightly convex and brought to an edge. The longitudinal section is thick near the base, thinning abruptly near the widest point; the transverse section is plano-convex. Flaking is sometimes steep, and coarse, probably partly the result of percussion.

The second specimen (Plate VI, fig. b) is approximately triangular but with sides nearly parallel for a short distance above the straight base. About 15 mm above the base, shallow serration commences and runs to within a few millimetres of the tip. The cross-section is thick and almost hexagonal. One edge seems to have been battered into shape; the other shows more regular serration. The tip and adjacent edges have been splintered off by what appear to be burin blows but may be the effect of shooting or thrusting the point against a hard surface.

Stemmed Projectile Point

Heavy rolling and weathering have almost obliterated the features of this specimen. The blade appears to have been basically triangular, and the stem wide and contracting. Shoulders are very shallow and rounded. The base is pronouncedly diagonal and is worn flat, suggesting that it may have been broken. The cross-section is lenticular. Although this specimen was found in the humus of Locality B, its uniquely weathered condition suggests that it may belong with an earlier occupation.

Projectile Point Fragments

Five tip fragments range widely in size (Plate VI, figs. c, d, e, f). Most of them are basically triangular, with cross-sections ranging from lenticular to plano-convex. One specimen (Plate VI, fig. c) is thick and slightly serrated and may be comparable to the lanceolate points described. The largest specimen (Plate VI, fig. e) appears to have been percussion flaked, with fine pressure nibbling of the edges. A third specimen (Plate VI, fig. f) may be a drill or perforator rather than a projectile point. It is narrow with almost parallel sides, a thick diamond cross-section formed by even collateral flaking, and a blunt tip.

PECKED STONE

Biconically Perforated Stone

A small, flattened, elongated oval pebble of spotted hornfels has been biconically perforated by pecking at the approximate centre. The larger cone of perforation tapers from 22 mm in diameter at the surface to about 4 mm where it meets the opposite cone. There is little or no evidence of wear around this hole. The stone may have been used as a line or net sinker.

GROUND STONE

Stemmed Ground Slate Point

Made of a blue-grey slate, this point has been heavily rolled. The blade outline is of laurel-leaf shape. The specimen has rounded shoulders and a short, narrow, parallel-sided tang, with diagonal rounded base. The blade was probably hexagonally ground, but the facets have been largely obliterated by weathering (Plate VI, fig. i).

Edge-Ground Stones

One specimen (Plate VI, fig. j) is wedge-shaped, with sides slightly converging to a rounded bit. The longitudinal section is approximately triangular, and the transverse section is plano-convex. A pebble of fine-grained diorite has been modified by grinding a band 20 mm wide down the centre of the convex face from the broken proximal end to the distal end. The plane face is primarily a fracture surface, although it received some subsequent polishing. Near the bit, the plane face is bevelled to meet the convex face. Finally, the edge of the bit, particularly toward one side, has been ground very smooth, probably through use.

A second specimen consists of a large, weathered but otherwise largely unmodified outside spall of porphyritic andesite. The specimen is approximately trapezoidal in outline and tapers from a thick, unworked back towards the thin, shortest side of the trapezoid, where bifacial bevelling to an edge and several ground facets are evident. Adjacent to the ground edge is a convex chipped edge that forms one of the more or less equal sides of the trapezoid. Function of these specimens is uncertain.

Ground Stone Awls

Two awls or points are made from long, thin splinters of sandstone, approximately round to rectangular in cross-section and smoothed by weathering, in the one case over all, in the other over part of the surface. On the longer specimen (Plate VI, fig. h), the smaller end of the splinter has been abraded to a point. On the shorter specimen, a naturally sharp point may have been modified by polishing.

Ground Slate Object Fragments

Two very small, thin fragments of slate were recovered. One shows slight edge-bevelling, and the other shows facial grinding.

Abrasive Stones

Five bifacially ground and sixteen unifacially ground unshaped abrasive stones were recovered. All are of sandstone except for one slate specimen. Outline, size, and wear vary extensively throughout the sample. Two shaped abrasives were found. One of these is a small, elongated sandstone bar, about the size and shape of a modern pocket whetstone. It is bifacially ground, rounded on one side, and ground flat on the other side as though from extensive use. Both ends are broken. The second specimen has been ground flat on both sides as well as on faces.

Small Adze Blade Fragment

Made of a yellow-brown serpentine, this narrow adze blade is thick and has approximately straight sides that converge slightly toward the butt. The cross-section is approximately rectangular. The bit and butt are largely fragmentary. However, the former was probably bevelled primarily from one face, while the latter was rounded. Saw grooves have been obliterated.

Shale Disc Beads

Seven specimens are irregular in outline but are approximately round, rectangular, or triangular. Perforations are drilled fairly straight through, from face to face. One face of the smallest specimen has been bevelled to an edge so that the cross-section is plano-convex. Faces of other examples are squarely ground, and peripheries are ground at right angles to the faces (Plate VII, fig. d).

T-Shaped Labrets

Two specimens are certainly T-shaped labrets, and a third appears to be a labret fragment. The smaller specimen (Plate VII, fig. a), made of serpentine, has a cylindrical projecting pin that was ground squarely across the exterior facet. The interior flange has an oval-shaped outline with flattened ends and is slightly cupped or saddle-shaped in section. It curves smoothly to meet the exterior segment. The exterior face has been shallowly drilled at the centre.

The larger, nearly complete specimen (Plate VII, fig. b) is made of a soft white stone, is heavily patinated, and is similar in form to the previous example. The exterior segment was relatively larger, but it has been broken off. A remaining facet suggests that it was rounded or pointed.

The fragment (Plate VII, fig. c) is abruptly squared at the extremity and appears to be part of the wing of a very large T-shaped labret.

GROUND ANTLER AND BONE

Unilaterally Barbed Antler Point Fragment

This medial fragment of antler point (Plate VII, fig. e) consists of three barbs fairly low and close together and deeply incised into the shaft. The shaft is asymmetrically elliptical in cross-section. Incisions are deeper on one face than on the other. The barbs have slightly convex backs and slope from the shaft at a relatively low angle. The specimen has a fairly high polish but shows some signs of longitudinal scraping or coarse abrasion.

Mammal Bone Splinter Awl Fragments

Three abraded or polished splinters of bone may be fragmentary awls.

Antler Tine Object

This is a fairly large tip segment of antler tine, chopped or cut from the beam. Abrasion is evident particularly at the distal end, which has facets around nearly half its circumference.

Antler Wedge Fragments

Probably made of elk antler, both specimens have been split longitudinally and severed at the proximal end. The smaller example is asymmetrically bifacially bevelled and burned or oiled. The larger specimen appears to have been bevelled on one face only.

Cut Bone

Seven additional specimens of cut bone or unidentifiable worked fragments were recovered. Three of these are rib sections.

WORKED SHELL

California Mussel Shell Adze Blade Fragment

This fragment of *Mytilus californianus* shell (Plate VIII, fig. f) appears to have been thin and rectangular in outline with fairly steep unifacial bevelling at one end. It was ground primarily on the outer face and on one long side. The base and the other long side were broken off. It may have served as a knife or scraper, and it could belong in the late component.

MINERAL PIGMENT

Ochre

Eight possible pigment specimens, ranging in colour from reddish brown to yellow, were recovered.

TABLE 3—QUANTITY AND PROVENIENCE OF EARLY COMPONENT SPECIMENS

Specimens	Quantity		Size range of specimens				Provenience			
	Total	No. measured	Weight	Length	Width	Thickness	A–A	A–B	A–D	B–C
Cores, flakes	–	–	–	–	–	–	–	–	–	–
Irregular scrapers	13	13	5.5–117.0	33–104	16–54	9–24	1		10	
Ovoid scrapers	3	3	15.2–27.8	34–50	30–42	13–15		1?	1	
Flake knives	6	4	11.3–57.1	49–70	28–46	7–16	3		1	2?
Chipped slate knife	1	1	23.5	62	49	5		1		
Bifacial bilateral knives	3	3	3.4–17.5	23–37	19–44	6–11			3	
Lanceolate projectile points	2	2	14.7	59	26	9				1
			20.0	64	25	11		1?	1?	
Stemmed point	1	1	8.7	39	25	8				
Point fragments	5	0	–	–	–	–	1	1	1–2?	1?
Perforated stone	1	1	55.7	62	38	17	1			
Ground slate point	1	1	13.7	65	25	7				1?
(stem)				7	10					
Edge-ground stones	2	2	200.2	93	77	25			1	
			–	–	62	22			1	
Ground stone awls	2	2	2.1–6.6	33–71	7–12	6–8	1		1	

Table 3—Contd.

Specimens	Quantity		Size range of specimens				Provenience			
	Total	No. Measured	Weight	Length	Width	Thickness	A–A	A–B	A–D	B-C
Ground slate fragments	2	0	–	–	–	–			2	
Abrasive stones	23	0	–	–	–	–	5	2	15 ca.	
Small adze blade fragment	1	1	23.2	49	32	9			1	
Shale disc beads	7	7	0.1–0.3	5–8	4–8	2–3			7	
T-shaped labrets	3	1	6.3	26	14	14			3	
Unilaterally barbed antler point fragment	1	1	–	–	11	5		1		
Mammal bone splinter awl fragments	3	0	–	–	–	–	2		1	
Antler tine object	1	1	15.2	74	18	16		1		
Antler wedge fragments	2	1	–	>120	–	–	1?	1		
Cut bone	7	0	–	–	–	–	2	1–2?	3	
Mussel shell adze blade fragment	1	1	–	–	–	5				1?
Mineral pigment, ochre (?)	8	0	–	–	–	–		1	7	
Totals	99	46					16–17	9–12	70–72	1–6

LATE COMPONENT FEATURE

The Late Component from the Fossil Bay site constitutes materials from Strata A and B of the Locality B shell mound. A composite sample of charcoal obtained from near the base of Stratum B of this mound has been dated at A.D. 436±40 years (UW 24, Dorn and others 1962: 7).

Feature B 2—In Locality B, the surface of the midden slopes down pronouncedly to the west, from the ridge to the present beach, and is generally parallel to the apparent slope of bedrock (Plate V). This slope is broken by a mounding or lip of shell layers near the western extremity of the midden. In the section along the 2-metre north line (Figure 5) there is an apparent depression that measures approximately 690 cm from lip to lip (from 30 cm west to 660 cm east of point '0'). The bottom of the depression, which lies 75 to 100 cm below the surface, is marked by concentrated lenses of yellow ash, charcoal, and sea urchin fragments, which may represent a house floor. This floor runs for approximately 678 cm along the section. Near the eastern extremity of the depression, a massive abrasive stone was lying in and partially buried by one of the ash concentrations. The profile of the depression suggests the slumping of shell material into a once relatively straight-walled excavation.

LATE COMPONENT BONE AND SHELL

Tentative identifications were made of some of the faunal remains recovered from the Locality B mound of Sucia Island and are listed in Table 4. The identifications were made with the aid of a comparative collection but were not checked by specialists. A question mark following a species indicates a particularly uncertain identification. The number of bones recovered or identified was insufficient to permit meaningful quantitative analysis.

TABLE 4—TENTATIVE IDENTIFICATION OF FAUNAL REMAINS, SITE, 45SJ105 B

Group	Species present	Popular name
Mammals	*Canis familiaris* or (*Canis latrans*)	dog (or coyote)
	Odocoileus hemionus (*columbianus*?)	deer
	Cervus canadensis?	wapiti (elk)
	Castor canadensis?	beaver
	Enhydra lutris	sea otter
	Phoca vitulina richardii?	harbour seal
	Eumetopias jubata	sea-lion
Birds	*Branta canadensis*?	Canada Goose
	Larus glaucescens	Glaucous-winged Gull
	Cathartes aura teter?	Turkey Vulture
	family *Anatidae*	duck
Fish	*Squalus suckleyi*	dogfish
Shellfish	*Mytilus edulis*	edible mussel
	Saxidomus giganteus	butter clam
	Protothaca staminea	little neck clam
	Macoma nasuta	bent-nose clam
	Clinocardium nuttallii	basket cockle
	Thais sp.	whelk
	Schizothaerus nuttallii (or *S. capax*)	horse clam
	Acmae sp.	limpet
	Chiton sp.	chiton
	Balanus sp.	barnacle
	Strongylocentrotus sp.	sea urchin
	Cancer sp.	crab

The preponderance of land mammal bone on such a small island is surprising, but a number of sea mammal bones may remain in the unidentified category. Deer and elk occupied some of the larger San Juan Islands. Compared to their scarcity in Locality A, remains of fish were numerous in the Locality B midden, where 1,110 vertebrae and 4,623 additional fragments were counted. No species were positively identified except dogfish. Salmon may have been present, although Bryan (1963, Appendix B, p. 8, citing Welander) notes that "salmon bones are cartilaginous and therefore not preserved." Shellfish were identified on the basis of specimens in level bags.

LATE COMPONENT ARTIFACTS

Table 5 indicates quantities and size ranges of specimens from Strata A and B of Locality B. Weights are in grams; measurements are in millimetres. Stratigraphic provenience within these units does not seem to be significant in terms of the small sample. Chipped stone was virtually absent.

PECKED STONE

Pitted Hammerstone

A flat, oval, greywacke cobble has been battered slightly on both faces near one end.

GROUND STONE

Hand Maul Fragment

Made of greywacke, the specimen consists of approximately half of the striking surface of a spool-shaped (?) hand maul, broken off by a blow on the side just above this striking surface.

Ground Slate Knife

This is an unusually thick, ulo-like knife, made of a dark grey slate. Its outline is a rectangle with rounded corners, and in cross-section it is approximately lenticular. Both the longer sides are bifacially bevelled, and there is some bifacial chipping on the ends.

Abrasive Stones

One stone is massive and approximately rectangular in outline; its sides converge slightly towards one (apparently broken) end. Width is approximately 185 cm; thickness is 78 cm. The faces and sides are ground completely to their conjunction and cross-section thins slightly toward the broken end.

Four bifacially ground abrasives are shaped or ground on one or more sides as well as on the faces. Sixteen irregularly shaped abrasives are unifacially ground, and nine are bifacially ground.

Sandstone Saw Fragment (?)

This bifacially ground fragment is trapezoidal in outline and is bevelled to a flattened edge on the longer of the two parallel sides. From this edge, one of the diverging sides has been ground square; a third side as well as the longer parallel side is apparently broken.

Incised Stone

A thin exfoliated flake of siltstone has been incised and broken into an approximately oval shape and has been decorated on the smooth, slightly convex face. The incised design might represent a horned animal or a fish (Plate VIII, fig. g).

Flat, Unbarbed Bone Points

Flat bone points may have served as end blades for composite harpoon heads, or as arrow points. Five fragmentary specimens have thin, approximately rectangular cross-sections and appear to have narrowed in both directions from centre and thinned to a wedge-shaped tang. The specimens have been ground transversely. Two complete examples (Plate VIII, fig. e) have an approximately lenticular outline and are plano-convex to almost triangular in cross-section. A wedge-shaped tang has been ground squarely along the sides and at the base. The widest portion of one specimen is approximately at the middle (Plate VIII, fig. e), while the widest portion of the other is about one-quarter of the distance from tip to base. Transverse abrasion along with bifacial bilateral bevelling has produced edges from the widest portion to the tip.

Mammal Bone Bipoints

Four bipoints, two of which are fragmentary, are approximately round in cross-section and taper symmetrically from the middle. Two additional examples are widest and thickest at approximately one-third to one-fourth the distance from one end to the other. The finish varies. Both varieties may have served as barbs for composite fishhooks.

Bird Bone Bipoints

Two points are very small and thin, and are bi-tapered from a widest and thickest point near the middle. Their cross-sections are slightly concavo-convex. The shaft of the longer specimen is very narrow, while that of the shorter specimen is wider.

Single-Tipped Mammal Bone Point

This point is virtually parallel-sided throughout the proximal half; then it tapers from the middle to a wedge-shaped tip. The butt is ground squarely across. The cross-section ranges from plano-convex to rectangular.

Bone Point Fragments

An additional five fragments are derived from points of uncertain form.

Unilaterally Barbed Bone Point Fragment

A single specimen is fashioned from a section of mammal bone abraded chiefly on the interior face (Plate VIII, fig. c). Barbs are generally convex, but a shallow notch in front of each barb gives them a slightly angular outline. The barb nearest the tip consists only of a slightly raised portion of the shaft. The others are of medium height, are flattened in front, brought to a sharp edge toward the back, and undercut with a smooth round notch back to the shaft. The point as a whole narrows toward the tip. The cross-section is plano-convex near the butt, but it is approximately rectangular near the tip. An unknown portion of the proximal end and a small portion of the tip have been broken off.

Antler Composite Harpoon Valves

In outline, these valves taper to both ends from a widest point near the middle. In longitudinal section they are triangular, with an obtuse angle at centre point, and in transverse section are plano-convex. One-quarter to one-third of the length of four specimens (two fragmentary) has been thinned on the plane or inner face of the distal end to provide a seating for the end blade. Beginning just behind this blade bed, but on the convex face, is a wide encircling groove that occupies another one-quarter to one-third of the total length. A fairly small, short shaft groove occurs, with most of its length to the rear of this binding groove (Plate VIII, fig. b).

Three additional specimens are generally similar to the above but lack a well-defined blade bed and a clearly marked binding groove. Two of these valves were cemented together with a white substance, possibly the remains of pitch (Plate VIII, fig. a). The third specimen is fragmentary, short, and small, with a crudely formed shaft groove. All specimens are made of antler; they are finished by longitudinal scraping or cutting and by transverse abrasion. All have probably been used with flat cutting blades of stone, bone, or mussel shell.

Mammal Bone Splinter Awls

Seven apparently complete and ten probably fragmentary examples were recovered. They were made from large, irregular splinters of mammal bone. One specimen is lightly ground all over its surface; the rest are abraded or have been used only near the tip.

Antler Adze Blade Collar Fragment

A single fragment is derived from an artifact of doubtful original form. The complete end indicates manufacture by chopping or gouging. The seating for the blade would have been relatively narrow.

Antler Wedges

One medium-sized specimen has a thin, roughly faced, bifacially bevelled, curved bit, squared in outline with fairly sharp polished edges. The short shank and chopped proximal end suggest that it was cut from a longer wedge. A second small, partly fragmentary wedge is made of a tip section of antler. It is strongly curved, with a rounded bit, and bevelled from butt to tip on one face. The butt shows signs of pounding. Two additional specimens are fragmentary. One is a medium-sized wedge, incised down the centre, broken, and subsequently ground. The other is probably part of a medium-sized, unifacially worked wedge.

Incised and Socketed Antler Tine

The specimen (Plate VIII, fig. d) consists of an antler tine tip, severed at the base by chopping or cutting. In the base is an oval hollow. Deep longitudinal incisions, produced with a sharp-edged instrument, extend along opposite sides of the shaft from base almost to tip. The specimen may have been a knife or scraper handle, or perhaps it is merely raw material. Antler objects frequently seem to have been cut into segments after fragmentation and re-used.

Antler Tine Tip with Wedge-Shaped Base

A specimen of an antler tine tip was cut roughly around its circumference and severed a short distance below the resulting groove. Subsequently, an expanding tang with wedge-shaped cross-section was produced by extensive grinding from both faces. The specimen may have been merely antler detritus.

Miscellaneous Worked Bone and Antler

Twelve unclassified specimens of cut, incised, or abraded bone, and three unclassified specimens of antler were recovered.

TABLE 5—QUANTITY AND SIZE OF LATE COMPONENT SPECIMENS

Specimens	Quantity		Size range of specimens			
	Total	No. measured	Weight	Length	Width	Thickness
Pitted hammerstone	1	1	350.1	93	80	32
Hand maul fragment	1	0	–	–	–	–
Ground slate knife	1	1	147.4	117	78	11
Abrasive stones	30	0	–	–	–	–
Sandstone saw fragment	1	0	–	–	–	–
Incised stone	1	1	67.0	96	53	13
Flat, unbarbed bone points	7	2	1.6–1.9	>41–51	12–13	4–5
Mammal bone bipoints	6	4	0.5–1.0	35–40	3–6	3–5
Bird bone bipoints	2	1	0.1	37	2	1
Single-tipped mammal bone point	1	1	2.7	45	10	6
Bone point fragments	5	0	–	–	–	–
Unilateral barbed bone point fragment	1	1	–	–	15	7
Composite harpoon valves, paired	1	1	5.1	66	19	14
Single composite harpoon valves	5	2	>2.4–2.6	72–75	10–13	7–10
Mammal bone splinter awls	17	5	2.7–13	67–121	9–15	5–11
Adze blade collar fragment	1	1	–	–	–	17
Antler wedges	4	2	11.2–?	59–66	?–32	10–12
Incised socketed antler tine	1	1	23.8	119	32	21
Antler tine tip	1	1	5.4	38	15	12
Miscellaneous worked bone, antler	15	0	–	–	–	–
Totals	102	25				

SUMMARY AND COMPARISONS

Two distinct cultural manifestations were observed at the Fossil Bay site on Sucia Island. These have been tentatively termed early components and a late component.

The early components are characterized by stone chipping, notably chipped stone projectile points, and by stone grinding as exemplified by labrets, stone beads, a stemmed ground slate point, and a small adze blade. Additional diagnostic artifacts or traits include an antler barbed point, a shell adze blade (?), and the scarcity of such items as ground slate, bone objects, and fish bone. In the deepest stratum of Locality A of the Fossil Bay site, shellfish remains also were scarce or absent. Land- and perhaps sea-hunting therefore were probably the major activities, while fishing and, for a time, shellfish gathering were of secondary importance. A single perforated stone is the only likely artifactual evidence for fishing, although a few fish bones were found in the midden of Locality A.

In their general context, as well as in certain specific traits of the small sample, the early components from the Fossil Bay site, Sucia Island, resemble the Marpole phase in the Fraser Delta, which has acceptable dates ranging between 400±60 B.C. and A.D. 170±60 (McCallum and Dyck 1960: 77). In the lower Fraser region, stone labrets are represented in both the Marpole and Locarno Beach phases (Borden 1962: 13, Plate 5), although specimens from Marpole are more nearly similar to those from Sucia. Ground slate points, some of them stemmed, also occur at both Marpole and Locarno Beach sites (Borden 1962, Plate 3), and shale disc beads appeared at the former (Borden, pers. comm.). Chipped stone points are numerous at Marpole (Borden, pers. comm.), although specific forms are not clearly similar to those from the Fossil Bay site. Perforated stones and adze blades occur. Antler points predominate over bone at Marpole (Borden 1962: 12–13, Plate 2; pers. comm.), and the single barbed point from Sucia Island, Locality A, is made of antler.

Stratum D of Locality A at the Fossil Bay site contained artifacts and charcoal but virtually no shellfish remains, although these layers were immediately overlain by strata in which shells were abundant. The repetition of this stratigraphic pattern in several other sites on the San Juan Islands (King 1950: 6–12; Carlson 1960: 571–3) and on the Washington mainland (Bryan 1963: 30, 35) suggests that a variation in the seasonal use of a given site, or in food preferences over a period of time, might be represented, rather than simply a change in the location of house floors and dump area. These food preferences might have been related to a fluctuating availability of shellfish resources owing to changes in land or sea that occurred over a broad area. On the other hand, cultural factors may be primarily responsible, and the change may represent the adaptation of 'Archaic' type cultures to a progressively more maritime way of life (King 1950: 78–80; Bryan 1957: 7; Tuohy and Bryan 1959: 46).

Because of the known practices of ethnographic peoples, it is difficult to estimate the significance of the above stratigraphic and apparent ecological change. Several Salish groups utilized the northern San Juan Islands in early historic times (Suttles 1951, Map 3; Barnett 1955) and perhaps for a substantial portion of their prehistoric past. The archaeological record may have been greatly confused by the fact that Indians of the southern Northwest Coast tended to move seasonally to various localities for particular economic activities. Therefore intimations of ecological or cultural change through time that are not amply supported by radiocarbon dates and multiple excavations must be frequently qualified.

The late component at Fossil Bay is accompanied by an abundance of fish bone, suggesting that the intensive fishing of historic times and perhaps even the ethnographically attested practice of reef netting were already present. In historic times, the Salish owned reef net locations on the northwest shore of Orcas Island, and migrating sockeye (*Oncorhynchus nerka*) passed a mile or two west of Sucia on their way to the Fraser River (Suttles 1951: 199, Map 8). At Locality B of the Fossil Bay site, small bone points and a single slate knife support the non-artifactual evidence for fishing.

Although fishing may have constituted a major economic activity, the occurrence of both land and sea mammal bones, as well as those of waterfowl, suggests that these were used fairly extensively as well. Ethnographically, seals were hunted off Sucia Island, and deer could be obtained two miles away on Orcas Island (Suttles 1951: 82, 91, 106, Map 6). Shellfish remains were abundant in the Locality B midden. As Suttles (1951) has indicated, the island environment of western Washington not only complemented the resources of the mainland, but shared a surprising number of these resources. Given adequate boats and competent short-range navigation, such resources not only would be comparably abundant to those on the mainland, but might be even more readily obtainable.

Bone and antler specimens from the late component on Sucia Island resemble some of those from the Stselax Village excavations at Musqueam in the Fraser Delta and from the San Juan phase described by Carlson (1960) on the basis of investigations at sites on San Juan and Lopez Islands. The earlier part of the Stselax Village occupation is dated by carbon-14 at A.D. 1290±130 years (S-20, McCallum and Dyck 1960: 77–8). Flat bone points for composite harpoons from the Sucia Island and Musqueam sites are nearly identical (Borden, pers. comm.); these also resemble some historic metal end blades. However, the harpoon valves themselves from Sucia perhaps more nearly resemble specimens from Whalen II in the Fraser region, dated at A.D. 370±140 (S-19, McCallum and Dyck 1960: 77), or approximately the same time as the Fox Cove B midden. Valves from Stselax Village show a greater diversity of types. The single slate knife from the late component is thicker than most Marpole or Musqueam examples and is perhaps closer to specimens from the Locarno Beach phase (Borden, pers. comm.).

Additional points of similarity with Borden's Developed Coast Salish and Carlson's San Juan phases are the virtual absence of chipped stone in the sites, the emphasis on small bone points, and the occurrence of barbed bone points (Borden, pers. comm.; Carlson 1960: 579–82, Fig. 4). The occurrence of shellfish remains as well as land and sea mammal, bird, and fish bone, implies a similar adaptation to the resources of late prehistoric times.

CONCLUSIONS

The early components from the Fossil Bay site on Sucia Island resemble the Marpole phase defined by Borden in the Fraser Delta and, in some respects, his Locarno Beach phase. The Marpole phase has been extended into northwestern Washington by Carlson (1960: 563) on the basis of two sites: Garrison on San Juan Island, and Richardson on Lopez Island. Although the four phases described by King (1950: 12, 78–82) from Cattle Point on San Juan Island may represent mixed components with respect to the Fraser sequence, a number of Marpole traits are present, particularly in 'Developmental' and 'Maritime' units. Several other excavated or tested sites in western Washington, for example, the lower levels at Cornet Bay and Rosario Beach, northern Whidbey Island (Bryan 1963: 30, 35–6, Appendix A 1, Fig. 16, No. 1–7), manifest a predominance of chipped stone, but their relationship with named phases is unclear.

Sites of Marpole (or Locarno Beach) character have not yet been described from south of the Skagit River Delta region (approximately 50 miles from the Canadian border at the Forty-ninth Parallel). In fact, large shoreline shell mounds appear to be concentrated in the northern part of the State of Washington, with nearly 450 sites recorded in Island, San Juan, and Skagit counties (Bryan 1963: 20–22, 81; Kidd 1966). Farther south, near the head of Puget Sound, probably on the west coast of the Olympic Peninsula, and around the mouth of the Columbia River (approximately 200 miles south of the Canadian border), considerably fewer such localities have been discovered. However, a number of small sites are situated inland from present eastern shorelines of Puget Sound, notably in the valleys of the Stillaguamish and Snohomish rivers. Several of these sites have yielded chipped stone tools of early character (cf. Butler 1961) that have collectively and provisionally been designated the 'Olcott complex.'

On a probably much later time level than the Olcott complex in this region, an apparent boundary of the distribution in significant quantities of certain traits closely associated with early Northwest Coast culture in the Fraser Delta can be drawn along a line immediately south of the Skagit radius. For example, with the exception of the Sucia Island specimens and a single unusual example (Plate VII, fig. f) from Penn Cove on Whidbey Island, labrets seem to be generally absent south of British Columbia and north of California. A number of labrets have been found in the Fraser Delta, on adjacent islands, and on southern Vancouver Island, the southern tip of which, however, extends south of the Forty-ninth Parallel to the approximate latitude of the Skagit. It is noteworthy that a specimen from the Point Grey district in the City of Vancouver is virtually identical to the example from Whidbey.

In northwestern Washington, as in the Fraser Delta, traits such as ground slate knives, slate points, and adze blades of nephrite or similar stone persist long after Marpole times. Knives and adze blades, for example, are numerous at the Tronsdal site in the Skagit Delta, an apparently late component, in which stone chipping is almost entirely absent. On the other hand, investigations farther south—for example, excavations near the town of Duval carried out by the Washington Archaeological Society (Nelson 1962), surface collections and tests in the vicinity of the White River in southern Puget Sound, excavations on the Western Olympic Peninsula (T. S. Newman 1959; Guinn 1963), and excavations north of the Columbia River mouth (Kidd 1960, 1967)—all produced relatively little evidence of these industries. Near Duval (Nelson 1962: 30–31A) and at the White River sites, a well-developed stone chipping industry of Plateau appearance was present. Finally, although only a few examples of art in stone and bone have been found in northwestern Washington, there seem to be some striking dissimilarities between the Fraser River art styles and those of the lower Columbia River.

Exceptions to the above generalizations certainly occur, and these generalizations tend to ignore some of the subtleties of geography in emphasizing the north–south over the east–west axis of Washington State. Furthermore, as Bryan observes (1963: 82), the distribution of raw materials and natural resources may be an important factor in these cultural distributions. However, the scarcity of such persistent traits as noted above in components later than Marpole, in components of uncertain date, and in general surface collections throughout the southwestern Washington area, all suggest that the traits were not prominent in these regions during Marpole times.

The late component at the Fossil Bay site on Sucia Island represents essentially the material culture and ecology of ethnographic western Washington Salish peoples. From this point of view, the single radiocarbon date is surprisingly early and may be of doubtful validity, perhaps because it was run on a composite sample. In a general way, this component corresponds to Borden's Developed Coast Salish phase in the Fraser Delta, and to Carlson's San Juan phase, the latter having been based on six sites in the San Juan Islands (Carlson 1960: 576–82). It also resembles Bryan's Penn Cove phase, described from several components on or near Whidbey Island (Bryan 1963: 88, Figs. 17–23).

As noted above, traits such as slate grinding and ground stone adze blades, present in Marpole but persisting into proto-historic times, are concentrated in approximately the northern third of western Washington State and in the Fraser radius. On the other hand, excavations at the Martin site in southwestern Washington (Kidd 1967) and tentative cross-dating with Wakemap at The Dalles of the Columbia, examination of surface collections in this vicinity and in southern Puget Sound, and evidence from a carbon-14 dated site on the Oregon Coast (T. M. Newman 1959: 15–16, 31–5, Plate V) suggest that stone chipping may have persisted in these regions after it had greatly diminished or largely disappeared in northwestern Washington and southwestern British Columbia (cf. Bryan 1963: 89–90).

Ethnographically, the northern Washington Straits region is distinguished, first of all linguistically, from southern Puget Sound, the southern Olympic Peninsula, and the region around the mouth of the Columbia River. The Straits form of Salish was spoken generally on the north, while the Puget Sound, Twana, and Chehalis Salishan forms were spoken in the south, along with non-Salish languages such as Chinook and Kwalhiokwa (Elmendorf 1960: 285). Further, certain Plateau-like characteristics appear to have been evident in cultures as well as in the geography of southern Puget Sound (Smith 1940; Haeberlin and Gunther 1930; Bryan 1963: 90–91). In northwestern Washington, on the other hand, Suttles (1951: 6, 498–9; 1960: 526) noted a concordance of the distribution of economic practices such as reef-netting for salmon with its associated ritualism, and the distribution of the Straits language, with southern portions of the Gulf Islands biotic area. Bryan (1963: 81–2) modified Kroeber's ethnographic culture-area schema to draw a cultural boundary south of Lower Skagit territory on the Washington mainland (despite the fact that the Lower Skagit Indians were Puget Sound speakers). He thus associated the Skagit River developments with those of the Fraser and further pointed to the persistence south of this line of a less maritime, more inland or prairie-oriented cultural tradition, which he designated "Trans-Cascadian" (Tuohy and Bryan 1959: 45–6). Subsequent work has generally borne out these suggestions.

As Kroeber (1939: 30) suggested, southern Puget Sound (and the Columbia mouth) may have been of more significance at an early stage in the development of Northwest Coast culture, and a greater homogeneity may then have obtained throughout western Washington and British Columbia. Beginning by Marpole times at least, a maritime development seems to have resulted in a cultural association or affinity between peoples of northwestern Washington and southwestern British Columbia. As Kroeber's theory of progressive climaxes would suggest (Kroeber 1939: 30), this development may have culminated in a diffusion sphere extending some distance to the north of the Fraser Delta, but a limited distance to the south. Probably the northwestern Washington sites were peripheral to the Marpole climax in the Fraser Delta area (Carlson 1960: 563). This cultural climax appears to have had considerable upriver extension, and to have possessed certain traits apparently derived from or shared with interior British Columbia (cf. Borden 1954). The early components of the Fossil Bay site may be peripheral not only to the Fraser climax, but also to major centres of habitation (such as Cattle Point) within the San Juan Islands area. The late component perhaps reflects a more central participation in an island- or inland waterway-oriented economy characteristic of recent times.

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PLATE VI

FOSSIL BAY SITE, EARLY COMPONENTS, CHIPPED AND GROUND STONE

(Reduced to ⅔ of actual size)

Fig.	
a-b	Lanceolate projectile points
c-f	Projectile point fragments
g	Ovoid scraper
h	Ground stone awl
i	Stemmed ground slate point
j	Edge-ground stone, two views.

PLATE VI

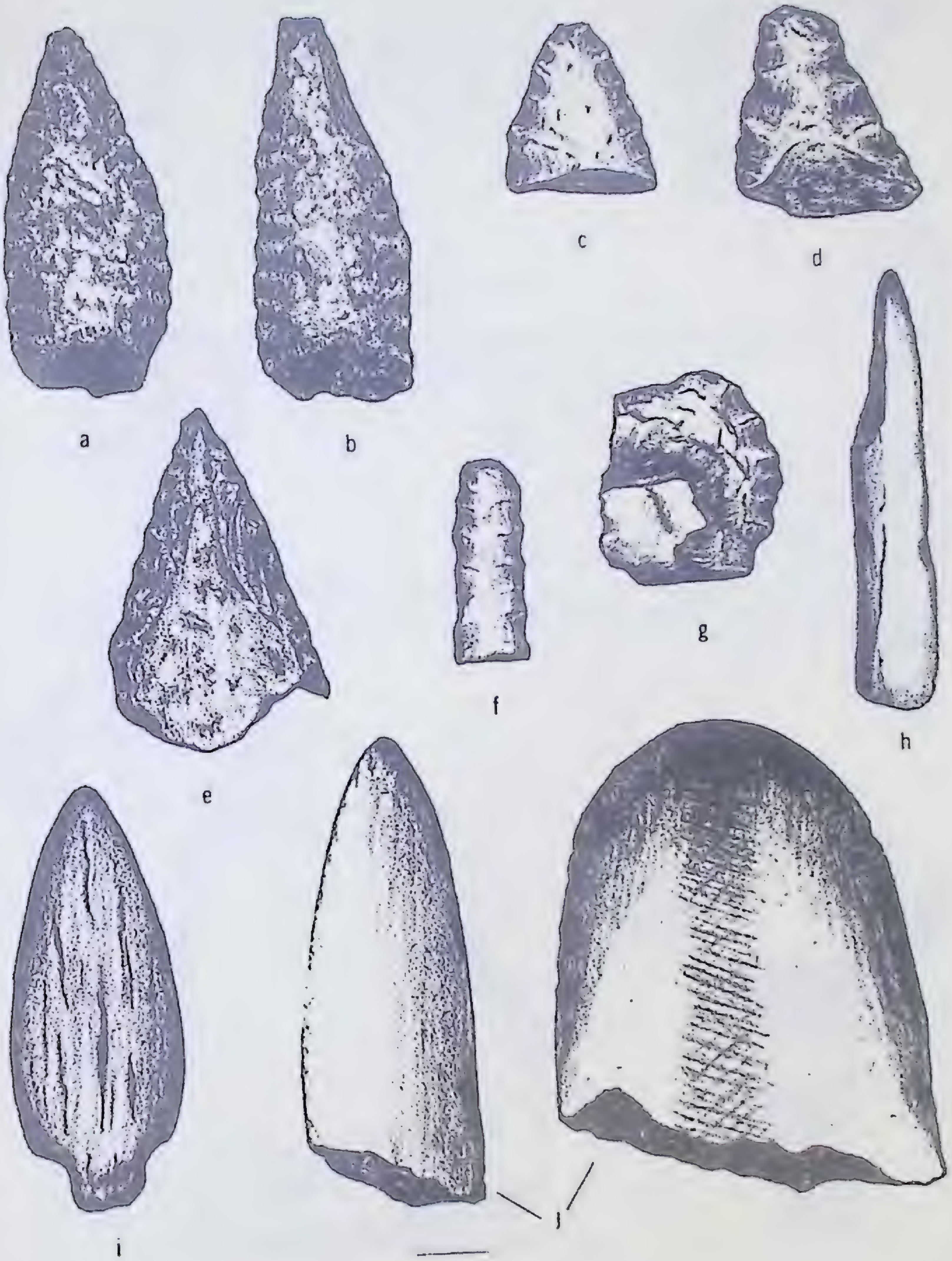


PLATE VII

FOSSIL BAY SITE, EARLY COMPONENTS, GROUND STONE AND ANTLER

(Reduced to ⅔ of actual size)

Fig.
a T-shaped labret, two views
b-c Labret fragments
d Shale disc beads
e Unilaterally barbed antler point fragment
f Winged labret, three views, from Penn Cove, Whidbey Island. Donated to the University of Washington by Mr. and Mrs. Glenn Lynch, Coupeville, Washington.

PLATE VII

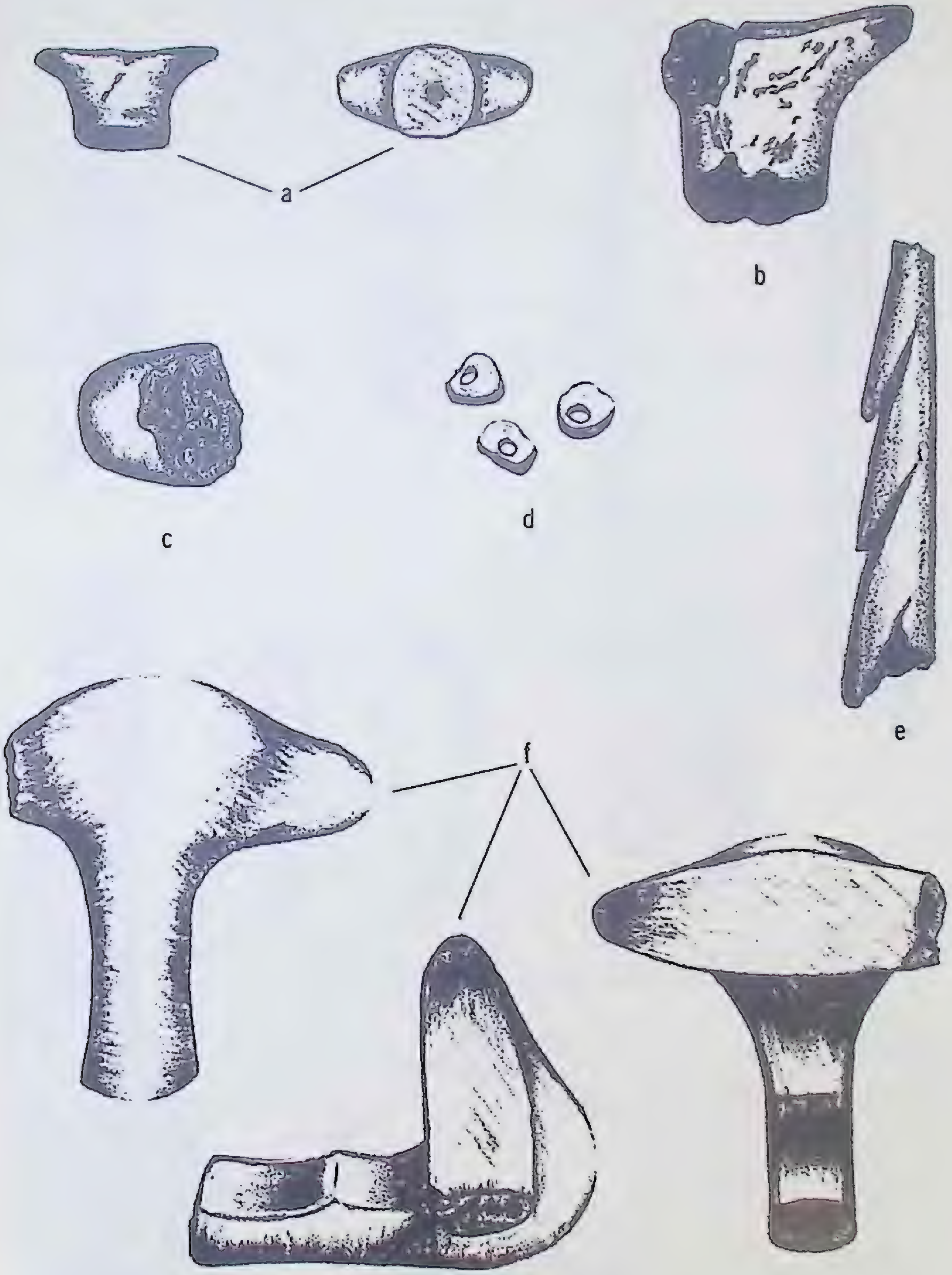


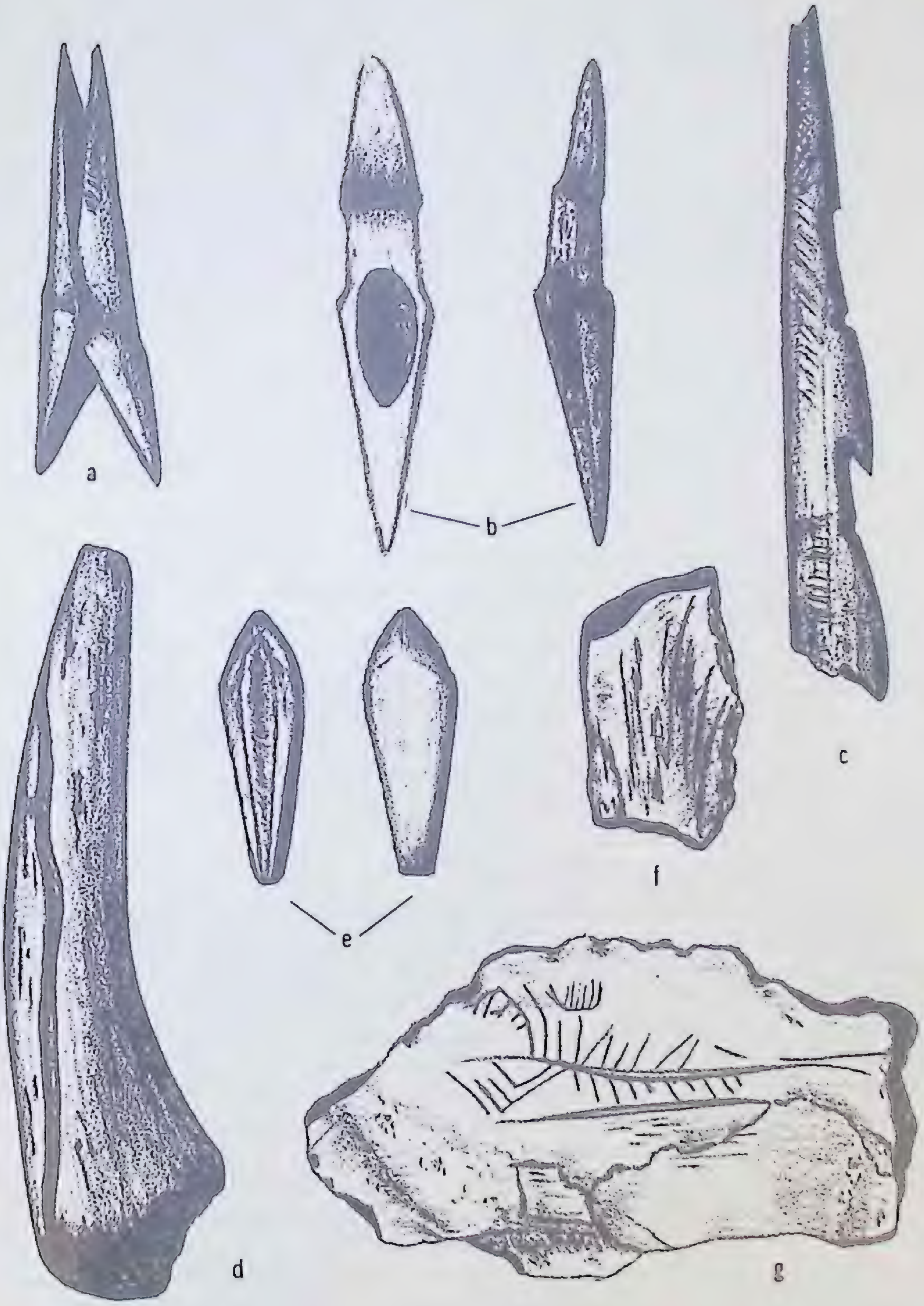
Plate VIII

Fossil Bay site, late components, incised stone, ground antler, bone and shell

(Reduced to ⅔ of actual size)

Fig.
a Composite harpoon valves, paired
b Composite harpoon valve, two views
c Unilaterally barbed bone point fragment
d Incised and socketed antler tine
e Flat bone point with plano-convex section, two views
f California mussel shell adze blade fragment (may belong to early component)
g Incised stone.

PLATE VIII



CANADIAN ARCHAEOLOGICAL RADIOCARBON DATES*

Compiled by Roscoe Wilmeth

RÉSUMÉ

Les récents progrès de l'archéologie canadienne se sont accompagnés d'une rapide multiplication des datations au radiocarbone. Les dates trouvées ont été publiées par plusieurs laboratoires dans les volumes de *Radiocarbon* et dans des ouvrages antérieurs, de sorte qu'elles ne sont pas d'accès facile aux chercheurs. Le présent travail donne une nouvelle liste qui comprend les dates déjà publiées et d'autres, inédites, qui sont extraites des dossiers des Musées nationaux du Canada; les dates sont classées d'après les endroits où sont situés les gisements respectifs qui ont fourni les objets datés. Dans les cas où la datation d'un groupe de spécimens provenant d'un gisement donné a pris plusieurs années, les observations de tous les archéologues ont été résumées dans un même énoncé.

SUMMARY

The growth of Canadian archaeology has been accompanied by a rapid accumulation of radiocarbon dates. These dates have been published by a number of laboratories in the volumes of Radiocarbon and its predecessors, and consequently they are not readily available to researchers. In this paper these published dates as well as unpublished ones from the National Museums of Canada file have been compiled in a new list and classified according to the geographical location of their respective sites. In cases where the dating of a series of samples from a specific site has extended over a period of years, the individual comments have been combined into a single statement.

INTRODUCTION

Since the 1952 publication of a date from the Burley site in Ontario (Chicago III: 674), the number of radiocarbon dates from archaeological sites in Canada has increased steadily. Their dispersion in two dozen date lists, contributed by about twelve different laboratories, impedes the access of researchers, particularly those working primarily in other areas. In addition, there are in the files of the National Museum of Canada Radiocarbon Project a large number of still unpublished dates. For this reason, it was decided to collect all the dates currently available and compile a new list (no attempt has been made to collect unpublished dates from other institutions). Sites are listed alphabetically under the heading of each province or territory, each of which is classified according to broader geographic divisions. Most of the sample descriptions are derived, with some rearrangement and abbreviation, from date lists already published. Thanks are due to the editors of *Science* and of *Radiocarbon* for granting permission to quote this material, and to

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* Submitted September 28, 1967.

Dr. K. J. McCallum and the Royal Society of Canada for their permission to quote from the Saskatchewan I date list, published in the Society's Transactions, volume 49 (1955). The individual date lists used, including the National Museums of Canada file, are cited at the end of each site description.

Something should be said about the way in which the comments of the submitters have been handled. Where all the dates from a site were published in one list, no problem has arisen. However, in several cases a rather long series of dates, determined by more than one laboratory, has been issued over a period of several years. Naturally, the archaeologist's view of the results has often altered as new dates, as well as new comparative data, became available. We have attempted to combine these comments into a single meaningful statement, hopefully without distorting the views of the submitters.

I. NORTHERN CANADA

A. YUKON

Engigstciak site (NiVk-1)

British Mountain, Firth River (lat. 69° 22′ N, long. 139° 39′ W according to Michigan V, lat. 69° 34′ 18″ N, long. 139° 22′ 30″ W according to Pennsylvania IV). Stratified site. Collected 1956 and 1958 by R. S. MacNeish, Nat. Mus. Canada (now at University of Calgary). Sources: MacNeish 1956, 1959; Michigan V: 39; Pennsylvania IV: 10.

M-622: 1570±200; A.D. 380. Twigs from peat layer. Expected to date British Mountain complex, but layer disturbed by solifluxion.

P-228: 3208±156; 1258 B.C. Antler from pit 32 (135 S, 25 W) level 3–4, 1.7 ft below cord marked and dentate-stamped ceramics. Thought to be an early variant of the Denbigh Flint complex.

Klokut site (MjVl-1)

Porcupine River *ca.* 6 mi above Old Crow (lat. 67° 54′ N, long. 139° 41′ W). Large seasonally occupied Athabaskan site with 3 to 4 ft of prehistoric deposits beneath late 19th to early 20th century levels with metal and glass. Matrix consists of flood deposited sands, silts, and clays on bank 30 ft above summer low water. Area IA and the west block are about 700 ft apart; their stratigraphic units are numbered differently. Collected 1966 by W. N. Irving and D. MacLeod, Nat. Mus. Canada. Source: Nat. Mus. Canada file.

GSC-779 (NMC-180): 600±140; A.D. 1350 (charcoal)
GSC-789 (NMC-180): 460±140; A.D. 1490 (bone)

Charred bone and charcoal from squares 0/W100–N5/W100, layer 1A, bottom of hearth basin directly above sterile silt. Late prehistoric occupation immediately after last major flood silt deposition. Estimated age 100 to 300 years. Irving comments that the dates, which should be the same, are considerably older than GaK-1263, which is attributed to a hearth in the same stratigraphic unit 100 ft away. However, at the west end of the site from where the samples came, there is no stratigraphic basis for discounting them.

GSC-747 (NMC-184): 650±130; A.D. 1300. Charcoal from area IA, feature 4, hearth, in south end of square 23, layer 6, depth 16 to 19 in., directly above sterile silt. Will date prehistoric occupation similar to upper strata but with minor trait differences. Will also give some indication of rate of deposition of sediment and rate of culture change relative to the upper and immediately inferior strata. Estimated age 500 years. Irving notes that the date conforms to most others in this series.

GSC-759 (NMC-189): 870±130; A.D. 1080. Charcoal from area IA, square 16-25, layer 10. Deep organic stratum, probably old burnt-off forest surface, 43 in. below surface. Probably dates forest fire which effected initial clearing of site thus rendering the area readily habitable for the first time. Deepest indications of occupation were found just above this level. Estimated age 600 to 800 years. Irving finds the date to be inconsistent with the majority of those in the series. According to its stratigraphic position below the oldest level of occupation debris, it should be much older than GaK-1252 and perhaps as old as GaK-1265. The dated material may have been intrusive through a large slump crack.

GaK-1263 (NMC-181): 180±80; A.D. 1770. Charcoal from N5/0, hearth (feature 11), bottom of layer 1A. From lower part of twice-used hearth, from layer with flint chips but no historic material. Upper part of hearth contained metal objects. Will date latest prehistoric occupation at site. Estimated age 100 to 300 years. Irving finds the date acceptable.

GaK-1264 (NMC-182): 910±70; A.D. 1040. Charcoal from square 0/W100, layer 4B, *ca.* 30 in. below surface. Scattered fragments of charcoal picked from bone midden resting on distinct occupation level. Will date prominent occupation level at top of lower third of cultural deposits. Estimated age 300 years. Dates agree with GaK-1249 and GaK-1252, which came from stratigraphically comparable level elsewhere.

GaK-1253 (NMC-185): less than 240 years. Charcoal from area IA, feature 7, hearth, in square 22, layer 6A, separated from inferior and superior strata by sterile silt. Will date prehistoric occupation virtually identical to that in strata 6 and 7. Difference in age would help calculate rate of sediment deposition and stability of cultural assemblage over period of time. Estimated age 300 to 500 years. Irving notes that date is inconsistent with GaK-1252 from layer 7 and with GSC-747 from layer 6. In view of dates from other parts of site, GaK-1253 probably has given a spurious date; no reason for the error can be suggested.

GaK-1252 (NMC-186): 1040±100; A.D. 910. Charcoal from area IA, square 13-22, layer 7. Deepest artifact-bearing stratum in area IA. Estimated age 600 years. Although older than expected, date agrees with others from same stratigraphic level.

GaK-1265 (NMC-187): 1790±80; A.D. 160. Charcoal from 10 S, 96 W, thin layer of charcoal just below hearth (feature 16), which in turn is below layer 5. Feature 16, deposit of ash with no accompanying artifacts, is probably oldest feature at west end of site. Will provide date very near first period of occupation, somewhat earlier than severe forest or brush fire. Estimated age 600 to 800 years. Irving comments that while most Klokut dates are older than expected, this date cannot be discounted on stratigraphic grounds although it is much older. If correct, it indicates a long period of relatively slow alluviation prior to the beginning of intensive occupation. The date may represent human activity at the site, but this is uncertain.

Commenting on the entire series, Irving points out that the dates are plausible if GSC-759 and GaK-1253 are discarded. GSC-779 and GSC-789 are suspiciously early for the bottom of uppermost prehistoric layer in the west block, especially when compared with GSC-747 from layer 6 in area IA. However, the series of four dates from the west block is internally consistent. Discrepancy between the two dates may reflect a difference in isotope proportions commonly noted in samples of bone and wood of same age.

In general, indication that the site was first occupied intensively about 1,000 years ago is acceptable, even though in excess of previous estimates. No comparable archaeological material from other sites has been dated. Earliest date (GaK-1265) may not represent human occupation. It should be borne in mind that most samples came from highly organic layers that thawed and became saturated every summer.

B. NORTHWEST TERRITORIES

1. DISTRICT OF FRANKLIN

Alarnerk site

Igloolik (lat. 69° 10′ N, long. 83° 59′ W). Samples from house ruins on raised gravel beaches. Dorset period, stage I. Collected 1954–1957 by J. Meldgaard, Danish Nat. Mus. Sources: Meldgaard 1960; Pennsylvania IV: 11.

P-212: 2404±137; 454 B.C. Antler from 22 m above sea-level.
P-213: 2910±129; 960 B.C. Ivory from 22 m above sea-level.

Meldgaard notes that antler samples date consistently younger than ivory, and that the ivory dates are believed to be more reliable.

Annawalk site (KeDr-1)

Near Okalivialuk, Lake Harbour area, Baffin Island (lat. 62° 44′ N, long. 69° 41′ W). Pre-Dorset typology and elevation suggest date of 2000 to 900 B.C. (many small rootlets present). Compares culturally with Early Sarqaq materials at Igloolik (*see* Kaleruserk and Kapuivik sites). Collected 1962 by M. S. Maxwell, Michigan State University. Sources: Maxwell 1962; Pennsylvania IX: 362.

P-708: 3814±69, 1864 B.C. Cinder-like material of charred (seal?) fat.

Avinga site (KdDq-8)

Cape Tanfield, Baffin Island (lat. 62° 39′ N, long. 69° 37′ W). Thirty-three feet above highest tide, with lowest cultural material 16 in. below sod base, resting directly on water-washed beach sand. Preliminary analysis indicates intermediate period between what has formerly been considered pre-Dorset and Dorset. On basis of 'Tanfield Valley' evidence, dividing point between the two appears to be presence of significant percentages of burins, burin-like tools, burin spalls, and ground and polished slate knives, which at this site are respectively 8.11, 3.15, 9.46, and 9.01 per cent. Estimated age 800 to 700 B.C. Collected 1963 by M. S. Maxwell, Michigan State University. Source: Michigan XI: 275–6.

M-1530a: 2180±120; 230 B.C.
M-1530b: (re-run) 1790±120; A.D. 160.

Charred animal fat scraped from cooking rocks from various parts of site, and one vessel fragment, all 8 in. or more below sod base, well into permafrost. Maxwell comments that it seems impossible that either sample could date major assemblage of site. In addition to a sampling error and the possibility of contamination, it has been learned that the lamp sherd, which contributed at least 75 per cent of the carbon, came from a small pocket of late artifacts just beneath the sod, and that it was separated from the major component by 6 in. of sterile humus. Age difference between carbon from lamp sherd and that from cooking rock is probably as much as 1,000 years.

Ballantine site (NiNg-3)

Ferguson Lake, Victoria Island (lat. 69° 24′ N, long. 106° 14′ W). Small midden area on knoll and perhaps scattered remains of three tent rings. Early Dorset, probably *ca.* 500 B.C. Collected 1965 by W. E. Taylor, Jr., Nat. Mus. Canada. Sources: Taylor, 1964, 1967, n.d.; Nat. Mus. Canada file.

I-2055 (NMC-88): 1260±95; A.D. 690. Peat from trench 1, square 8, depth 5 to 8 in. at lowest part of peat layer.

GSC-640 (NMC-105): 2220±140; 270 B.C. Charcoal and bits of bone or antler from trench 1, square 5, in midden stratum directly beneath modern humus layer and above underlying sterile gravel.

GSC-658 (NMC-106): 2450±220; 500 B.C. Bits of charcoal from trench 1, square 13, in midden stratum and specifically in lower part of that stratum at depth of 7 to 15 in.

Taylor regards the two last mentioned dates as quite satisfactory. However, the I-2095 determination is much too late.

Buchanan site (NiNg-1)

Ekalluk River (Ferguson River), Victoria Island (lat. 69° 24′ N, long. 106° 15′ W). Site early Dorset, with an outlier which is pre-Dorset. Collected 1963, 1965 by W. E. Taylor, Jr., Nat. Mus. Canada. Sources: Taylor 1964, 1967, n.d.; Michigan X: 141–2; Nat. Mus. Canada file.

M-1504 (NMC-2): 2185±120; 235 B.C. Raw antler, teeth, and bone from test cut no. 2, in moist dark brown humus layer, depth 3 to 8 in. Layer produced burins, burin spalls, quartz crystal microblade, antler arrowhead, coarse quartzite tools, animal bone, and antler fragments. Pre-Dorset assemblage, from one of few pre-Dorset sites in the central Canadian Arctic. Date should further knowledge of period of eastward spread of Arctic Small Tool tradition. Estimated age 1500 to 2000 B.C.

I-2053 (NMC-86); 2910±105; 960 B.C. Granular charcoals mixed with soil from trench 2, square 4, southeast quarter, depth 8 to 12 in., deepest part of midden. Pre-Dorset component.

I-2054 (NMC-87): 2990±125; 1040 B.C. Granular charcoal mixed with soil from trench 5, square B, in hearth remnant at depth of 4 to 5 in., base of culture layer. Pre-Dorset component.

GSC-656 (NMC-108): 2600±130; 650 B.C. Charcoal and bits of bone or antler from trench 4, square 1, depth 5 to 7 in. in hearth at east edge of square.

Taylor comments that M-1504 and GSC-656 dates are unacceptable and too late for pre-Dorset. I-2053 and I-2054 do fall within the pre-Dorset period, although near its ending and much later than expected. He notes that evidence for regional and temporal variation in pre-Dorset artifact form is still scanty, and that there is no reason for rejecting the two last mentioned dates, which indicate a late pre-Dorset occupation at Buchanan.

Closure site (KdDq-11)

Cape Tanfield, South coast, Baffin Island (lat. 62° 39′ N, long. 69° 39′ W). Pre-Dorset. Collected 1962, 1966 by M. S. Maxwell, Michigan State University. Sources: Pennsylvania IX: 362; Nat. Mus. Canada file.

P-707: 4067±73; 2117 B.C. Cinder-like material of charred animal (seal?) fat and sand from upper permafrost in west trench 40 ft above present sea-level. (Some small roots present.)

GaK-1281 (NMC-139): 4460±100; 2510 B.C. Charred fat (seal?) from encrusted cooking rock in test pit 6, square 55L5, surface depth .4 ft within active layer. Test pit 6 is at sea-level elevation of 45 ft. Should date same or be slightly older than P-707.

Maxwell, on receipt of the Pennsylvania date, noted that, since pre-Dorset typology and elevation suggested a date of 1100 to 800 B.C., the date was apparently too old. The site compared culturally with Igloolik materials associated with sample P-210 (*see* Kapuivik, below). His comment on the Gakushuin determination, made some time later, is that the date fits well with the archaeological evidence, a circumstance which indicates that the site is the oldest one in the continuum at Lake Harbour. The only surprising aspect of this date is that it is as old as archaeologically comparable material from the Bering Straits region.

Ferguson Lake site (NiNg-5)

Ferguson Lake, southeast Victoria Island (lat. 69° 24′ N, long. 106° 13′ W). Artifacts indicate early Dorset occupation. Collected 1965 by W. E. Taylor, Jr., Nat. Mus. Canada. Sources: Taylor 1967; Nat. Mus. Canada file.

I-2056 (NMC-89): 1055±100; A.D. 895. Peat from trench 4, square 4, depth 6 to 7 in. at base of humus layer in that part of the column most productive of artifacts. Taylor comments that the date is at least several centuries younger than the site, and therefore would be about 200 B.C. (*See* his comment on Ballantine site dates, above.)

K'aersut Island site

Igloolik area (lat. 69° 29′ N, long. 80° 19′ W). House ruin of latest Dorset stage on 8-m terrace. Culture shows influence of invading Thule people. Date gives period of contact between two cultures and probably end of Dorset in this area. Sea-level was *ca.* 6.5 m higher than at present. Collected 1954 by J. Meldgaard, Danish Nat. Mus. Sources: Meldgaard 1960; Copenhagen IV: 20–1.

K-504: 600±150; A.D. 1350. Caribou antler from which surface layers were removed.

Kaleruserk site

Igloolik Island (lat. 69° 23′ N, long. 81° 48′ W). House ruin at 'Parry Hill site' on terrace 51, 52 m above present sea-level. Early form of Sarqaq culture as described from west Greenland. Sea-level was about 50 m higher than at present. Collected 1954–1957 by J. Meldgaard, Danish Nat. Mus. Sources: Meldgaard 1960; Copenhagen IV: 21; Pennsylvania IV: 11.

K-505: 3700±300; 1750 B.C. Caribou antler, from which surface layers were removed.

P-208: 3560±123; 1610 B.C. Antler.

P-209: 3906±135; 1956 B.C. Ivory.

P-207: 3958±168; 2008 B.C. Ivory.

Meldgaard notes that the dates for antler are consistently later than those for ivory, but he believes the dates for ivory are more reliable.

Kapuivik site

Igloolik area (lat. 69° 10′ N, long. 83° 59′ W). Sarqaq period. Collected 1954–1957 by J. Meldgaard, Danish Nat. Mus. Sources: Meldgaard 1960; Pennsylvania IV: 11.

P-211: 2354±135; 404 B.C. Antler from 24 m above sea-level. Late Sarqaq.

P-210: 2898±136; 948 B.C. Antler from 44 m above sea-level. Early Sarqaq.

Kemp site (KdDq-8-2)

Cape Tanfield, Baffin Island (lat. 62° 39′ N, long. 69° 37′ W). Very rich stratified midden, depth 14 to 16 in., 31 ft above present high tide. Artifacts intermediate between pre-Dorset and Dorset. Estimated age 800 to 700 B.C. and 50 to 100 years later than Avinga site (*see* above). Collected 1963, 1966 by M. S. Maxwell, Michigan State University. Sources: Michigan XI: 278; Nat. Mus. Canada file.

M-1534 (NMC-22): 2200±120; 250 B.C. Charred fat has dripped on sand grains cementing them, from 8 in. beneath sod base, 2 in. below permafrost line. More recent of two components.

GSC-794 (NMC-135): 2040±130; 90 B.C. Wood (predominantly driftwood) from square 5L15, surface depth 1.2 ft in permafrost. Since driftwood used, date should be slightly older than midden. Earlier of two components. Typologically more recent than Tanfield site (*see* below).

Maxwell noted, on receipt of the Michigan date, that in spite of the discrepancy between the result and the estimate, the date was nevertheless satisfactory. Analysis of the material subsequent to the submission of the sample had indicated two components were present, with M-1534 providing a satisfactory date for the later occupation. The original estimate of *ca.* 800 to 600 B.C. applies to the earlier component, and the result of GSC-794 is therefore rejected.

Kiliktee site (KdDq-19)

Itivirk Bay, Baffin Island (lat. 62° 58′ N, long. 69° 40′ W). Small, possibly no more than two tent rings. Elevation estimated at 14 ft above present high tide. Terminal Dorset, estimated age A.D. 300 to 400. Typology and elevation suggest contemporaneity with Aberjar site, Igloolik, N.W.T. Collected 1963 by M. S. Maxwell, Michigan State University. Source: Michigan XI: 277–8.

M-1533 (NMC-21): 1670±150; A.D. 280. Charred animal fat has dripped on sand, cementing sand grains. Depth 4 in. beneath sod base, well above permafrost line.

Maxwell comments that date fits well with typology seriation from Lake Harbour vicinity, Baffin Island (*see* Sandy, Annawalk, and Killillugak sites).

Killillugak (Killalugak) site (KeDi-3)

Near Okalivialuk, Lake Harbour area, Baffin Island (lat. 62° 44′ N, long. 69° 41′ W). Elevation 33 ft. Non-stratified, cultural layer 4 to 6 in. thick. Early Dorset. Collected 1962 by M. S. Maxwell, Michigan State University. Sources: Maxwell 1962; Pennsylvania IX: 362–3.

P-699: 3043±63; 1093 B.C. Cinder-like material of charred animal (seal?) fat and sand from layer above permafrost.

Lady Franklin Point site (NdPd-2)

Lady Franklin Point, Victoria Island. Middens and house mounds of a Thule culture winter village. Estimated age *ca.* A.D. 1100. Collected 1963 by W. E. Taylor, Jr., Nat. Mus.. Canada. Sources: Taylor 1964, 1966; Nat. Mus. Canada file.

GSC-650 (NMC-111): 1330±130; A.D. 620. Burned bone and seal fat. No precise location because of cataloguer's error.

Taylor comments that artifacts from the site suggest an occupation roughly 400 years younger than the age suggested by this sample. General views on Thule culture chronology imply that the sample date is too old.

Loon site (KdDq-10)

Cape Tanfield, south coast Baffin Island (lat. 62° 39′ N, long. 69° 39′ W). Fifty feet above present sea-level. Elevation and pre-Dorset typology suggest date of 1200 to 1000 B.C. Compares culturally with Igloolik materials (*see* Kaleruserk and Kapuivik sites). Collected 1962 by M. S. Maxwell, Michigan State University. Source: Pennsylvania IX: 362.

P-710: 3577±69; 1627 B.C. Cinder-like material of charred animal (seal?) fat and sand from upper limit of permafrost.

McCormick Inlet site (QkPa-1)

McCormick Inlet, Melville Island (lat. 75° 49′ N, long. 112° 07′ W). Prehistoric dwelling 6 ft above high tide. W. E. Taylor, Nat. Mus. Canada, identified artifacts recovered as Dorset, site constituting northwesternmost occurrence of this culture discovered so far. Collected 1962 by W. E. S. Henoch, Geographical Branch, Ottawa. Sources: Henoch 1964; Taylor 1964*a*; GSC III: 180–1; Isotopes, Inc. IV: 270.

GSC-148: 1150±160; A.D. 800. Charred moss occurred mixed with fragments of charred wood and bone on upper surface of hearthstone and gave impression of having been placed there as fuel.

I-840: 1740±190; A.D. 210. Moss peat from below flagstones of house.

Henoch comments that the elevation and date suggest that positive movement of land for past one and a half millennia has been appreciably less than 1.8 m.

Menez site (NiNg-10)

Ekalluk River, southeast Victoria Island (lat. 69° 24′ N, long. 106° 15′ W). Pre-Dorset, and roughly comparable to Buchanan pre-Dorset material. Collected 1965 by W. E. Taylor, Jr., Nat. Mus. Canada. Sources: Taylor 1967; Nat. Mus. Canada file.

I-2058 (NMC-91): 2880±105; 930 B.C. Powdered charcoal mixed with soil from test cut 4 at depth of 4 to 7 in.

GSC-713 (NMC-107): 2980±150; 1030 B.C. Charred wood and charred bone from test cut 4, northwest quarter, at depth of 2 to 4 in. in single midden deposit, which ranged from surface to depth of 8 in.

Taylor comments that at this stage of analysis, it is not possible to suggest age of Buchanan and Menez materials in relation to each other. There is no present reason to challenge the radiocarbon-based suggestion that Menez was occupied very late in the pre-Dorset period, especially since the dates are consistent with each other.

Nanook site (KdDq-9)

Cape Tanfield, Baffin Island (lat. 62° 39′ N, long. 69° 37′ W). Midden 20 to 24 in. deep, all except top 6 in. in permafrost. Three components. Not beach site. Probably occupied in winter at time when sea-level almost 25 ft higher than at present. Typology fits into 12-site continuum for Tanfield Valley. Estimated date 700 to 600 B.C. Typology suggests coeval with site KdDq-8-3 (*see* below). Collected 1962, 1963, 1966 by M. S. Maxwell, Michigan State University. Sources: Michigan XI: 278–9; Pennsylvania IX: 363; Nat. Mus. Canada file.

M-1535 (NMC-23): 2410±120; 460 B.C. Pieces of seal skin, and sand grains cemented with charred animal fat, from 12 in. beneath sod base. Component III midden.

P-704: 1916±61; A.D. 34. Dried sod and grasses associated with animal skins and branches of possible sleeping platform from permafrost layer, between component layers I and II.

P-706: 1827±61; A.D. 123. Willow twigs associated with animal skins and dried sod and grasses of P-704.

GaK-1279 (NMC-127): 2220±100; 270 B.C. Sod from floor of feature 3. Should date early part of component II and be slightly older than P-706 and close in time to P-704.

GaK-1284 (NMC-128): 2380±80; 430 B.C. Seal, caribou skin, and other organic matter from approximate middle of component III midden. Should be older than P-704 and slightly more recent than M-1535.

GaK-1285 (NMC-130): 1400±80; A.D. 550. Sod from square 0L15, surface depth 1.3 ft in permafrost. Culturally sterile buried sod layer. Should provide date for time prior to earliest occupation of site. Estimated age greater than 2,450 years.

GaK-1286 (NMC-131): 2370±100; 420 B.C. Willow twigs from square 0L15, surface depth 1.2 ft in permafrost. Layer of indigenous willow twigs lies on thin gravel lens containing worked wood fragments and animal bone, overlies sterile sod level (GaK-1285). Should date beginning of component III occupation. Estimated age between P-698 from typologically earlier Tanfield site (*see* below) and M-1535 (this site).

GaK-1287 (NMC-133): 2110±80; 160 B.C. Whale baleen from square 15L10, depth .5 ft in permafrost. From component II midden. Should date about beginning of Christian era on basis of samples P-704 and M-1535. Provides date for middle of component and serves as additional check for other samples.

GaK-1288 (NMC-134): 580±80; A.D. 1370. Indigenous willow twigs from square 0L15, depth 1 ft in permafrost. From thin sterile zone lying immediately above skin layer (GaK-1284) and underlying charred cooking rock. Therefore underlies floor of feature 3 of component II. Should date hiatus between two components. Estimated age between 300 and 200 B.C.

Maxwell's comments reflect his changing views as analysis of cultural data proceeded and as radiocarbon dates accumulated. Samples were submitted prior to analysis of recovered data. Original interpretation postulated two, and perhaps three, components, occupying different horizontal segments of the site. Sections were numbered KdDq-9-1, KdDq-9-2, and KdDq-9-3, and so appear in Michigan XI and Pennsylvania IX. Since that time, the complex site situation has been reinterpreted to include an early component which underlies entire Nanook site (component III), a later occupation (component II) overlying only part of the site, and a still more recent occupation (component I) on another part of the site and lying immediately on top of component III. Date for M-1535, originally thought to be 400 years too early, is now acceptable. Date for GaK-1285 is impossible, perhaps because the sample was contaminated by meltwater seepage. GaK-1288 is also impossible. Other dates agree well with sequence.

Pembroke site (NgNc-2)

Freshwater Creek, Cambridge Bay, southeast Victoria Island (lat. 69° 07′ N, long. 105° W). Small Thule village. Collected 1965 by W. E. Taylor, Jr., Nat. Mus. Canada. Sources: Taylor 1964, 1965, 1966, 1967, n.d.; Nat. Mus. Canada file.

I-2059 (NMC-92): 705±120; A.D. 1245. Charred bone from house 5, 10 to 12 in. below surface and in area of small hearth against house wall.

Taylor comments that since artifacts suggest a rather early Thule occupation, the date is acceptable; but he prefers to add 120 years of range to obtain date of about A.D. 1125.

Sandy site (KdDq-2)

Juet Island, south shore Baffin Island (lat. 62° 37′ N, long. 69° 32′ W). Stratified, three layers, each about 2.5 in. thick, separated by thin zones of sterile sand. Small habitation site 13.5 ft above high tide. Late in local Dorset sequence on basis of elevation and typology. Collected 1960 by M. S. Maxwell, Michigan State University. Sources: Maxwell 1962; Michigan XI: 275.

M-1529 (NMC-17): 1470±110; A.D. 480. Charcoal, predominantly driftwood, but with some indigenous *Salix*. From third or bottom layer, combined with three different squares. Lag between death of tree and drift to area should be taken into account. Estimated age A.D. 200 to 400.

Maxwell regards date as satisfactory on the basis of current archaeological interpretation of seriation of site and assemblages on the southeast coast of Baffin Island. Since part of the sample was driftwood, cultural assemblage may be as much as 100 years more recent; this would also be satisfactory.

Date confirms interpretation that in this specific region use of true stone burins (constituting 6 per cent of total stone tool inventory of site) persists well into the first millennium.

Shaymare site (KkDn-2)

Sylvia Grinnell River, Frobisher Bay, Baffin Island. Pre-Dorset. Collected 1966 by M. S. Maxwell, Michigan State University. Source: Nat. Mus. Canada file.

GSC-849 (NMC-138): 4140±130; 2190 B.C. Charred fat (seal?) from pit 8, surface depth .5 ft. on basis of typological analysis, should be early in pre-Dorset sequence. Estimated age should be between P-707 for Closure site (*see* above) and P-708 for Annawalk site (*see* above).

Tanfield site (KdDq-7)

Cape Tanfield, Baffin Island (lat. 62° 39′ N, long. 69° 37′ W). Site 18 ft above present high tide. In this specific location its chronological position is early in Dorset sequence; typology agrees. Midden 18 to 22 in. deep, all except top 4 in. below sod permanently frozen. Covers estimated 1,100 sq ft. No stratigraphic layers, apparently short occupation. Collected 1962 and 1966 by M. S. Maxwell, Michigan State University. Sources: Michigan XI: 274–5; Pennsylvania IX: 363; Nat. Mus. Canada file.

M-1528 (NMC-16): 2390±150 and 2250±130; 370 B.C. Mass of charred material flaked from heavily encrusted cooking rock at 8 in. below sod and 14 in. below surface. Estimated age 600 to 300 B.C.; should be slightly more recent than T1 site, Southampton Island (Native Point, District of Keewatin, N.W.T., below).

P-698: 2608±50; 658 B.C. Cinder-like material of charred animal (seal?) fat and sand from heavily encrusted cooking rock below upper permafrost (part of same sample as M-1528 above).

GSC-820 (NMC-136): 2350±140; 400 B.C. Charred fat (seal?) from square 5R5, surface depth .5 ft. Thin midden lying closer to coast than major part of Tanfield midden. May be either earlier or later than major section. Estimated age 1,850 years.

GaK-1280 (NMC-137): 2360±100; 410 B.C. Sod and twigs from square 40L5, surface depth 1.4 ft, midden bottom. Should date very beginning of major midden. Estimated age 2,660 years.

Maxwell notes that the interpretation of this site has presented many problems. His comment on the Michigan and Pennsylvania dates, published simultaneously, expressed his opinion that the former was 200 to 350 years too late. At the time GSC-820 was submitted, the conclusion had been reached that Tanfield was coeval with one of the components at Nanook (*see* above), but that it represented a summer occupation, while that at Nanook was late autumn and winter. The GSC dates suggest contemporaneity with the end of Tanfield component II. The Gakushuin sample, from the earliest part of the midden, should have been earlier than the Pennsylvania date. The possibility of contamination exists.

Tyara site (KkFb-7)

Sugluk Island at entrance to Sugluk Inlet on south side of Hudson Strait (lat. 62° 15′ 30″ N, long. 75° 33′ 40″ W). Early Dorset culture site with three stratified midden layers. Collected 1958 by W. E. Taylor, Jr., Nat. Mus. Canada. Sources: Taylor 1958, 1959, 1964*b,c,* in press; Nat. Mus. Canada file.

GSC-702 (NMC-114): 2200±130; 250 B.C. Raw walrus and bearded seal bone from trench 1, level I. Estimated age slightly older than 235 B.C.

GSC-703 (NMC-116): 2630±130; 680 B.C. Raw walrus bone from trench 3, square 1, level II. Estimated age near 610 B.C.

GSC-701 (NMC-117): 2670±130; 720 B.C. Raw seal and bearded seal bone from trench 2, square A, level III. Estimated age *ca.* 700 B.C.

Taylor's original estimates were based on comparison with the material from Collins' T1 and T3 sites on Southampton Island (*see* Native Point sites, District of Keewatin, below). Comparisons suggested Tyara level I was slightly older than the average date for T3 and that Tyara level II was close in time to the early part of T1. Estimate for Tyara level III was based on Taylor's belief that this level was earlier than the oldest T1 date. Present series of dates supports all these estimates.

Umingmak site (PjRa-2)

Shoran Lake, Banks Island (lat. 73° 30′ N, long. 114° 20′ W). Multicomponent pre-Dorset culture site of buried middens and frequent scattered surface finds of cultural debris. Estimated age middle of pre-Dorset culture period. Collected 1965 by W. E. Taylor, Jr., Nat. Mus. Canada. Sources: Taylor 1967; Nat. Mus. Canada file.

GSC-669 (NMC-109): 3440±160; 1490 B.C. Burned bone and twigs from area A, test cut 9, in midden stratum at depth of 3 to 6 in.

GSC-651 (NMC-110): 3420±150; 1470 B.C. Burned bone and twigs from area A, test cut 9, in midden stratum at depth of 4 to 7 in.

Taylor comments that the dates, though slightly younger than expected, are consistent with each other and quite acceptable.

Wellington Bay site (NiNg-7)

Abut 1 mi southeast of mouth of Ekalluk river on southeast Victoria Island (lat. 69° 23′ N, long. 160° 17′ W). The site contains sample of pre-Dorset material, associated with high percentage of sea mammal remains, suggesting predominantly marine-based subsistance pattern at this site, at a time when sea-levels were considerably higher. Collected 1965 by W. E. Taylor, Jr., Nat. Mus. Canada. Sources: Taylor 1967; Nat. Mus. Canada file.

I-2057 (NMC-90): 3180±120; 1230 B.C. Powdered charcoal mixed with soil from section 3, test cut 1, in culture layer at depth of 7 to 8 in. Test cut excavated in north side of windblown edge of site, which caps a small hill.

Taylor notes that this date would be considered late pre-Dorset.

Site KdDq-8-3

Cape Tanfield, Baffin Island (lat. 62° 39′ N, long. 69° 37′ W). Cultural midden extending 16 in. below sod base. Bottom of lowest cultural level rested on old sod surface. Site apparently first occupied some time after retreat of sea water from this level. Site was not a particularly valuable location for habitation any time after the retreat of sea water to a 25-ft level. Site estimated to be 400 sq ft. Assemblage should be early in Dorset continuum. Estimated age 700 to 600 B.C. Should be slightly older than T1 site, Southampton Island (Native Point, District of Keewatin, below). Collected 1963 by M. S. Maxwell, Michigan State University. Source: Michigan XI: 277.

M-1532a (NMC-18): 3880±150; 1930 B.C.
M-1532b (NMC-18) (re-run): 3850±150; 1900 B.C.

Charred animal fat cemented sand grains from 10 in. below sod base, below permafrost line.

In his comment, Maxwell notes that the site falls within the period of developed Dorset culture and that a date earlier than 700 B.C. would conflict with interpretations of all archaeological investigations in the eastern Arctic. A re-run was made, but it confirmed the first date determination. Re-examination of data indicates that the sample was associated with very early stone tools now recognized as older than the major part of the assemblage. Sod containing artifacts and sample may have been cut from an earlier site (perhaps pre-Dorset Loon site, *see* above) for use in sod dwelling.

Site KdDq-13

Cape Tanfield, Baffin Island (lat. 62° 39′ N, long. 69° 37′ W). Site at 38-ft elevation north-facing slope of 'Tanfield Valley.' Thinly occupied. Satisfactory camping location only if sea-level 35 ft above present high tide. Estimated area 1,600 sq ft, 80 sq ft of which excavated. Assemblage appears intermediate between pre-Dorset and Dorset. Estimated age 1000 B.C. (but based on inadequate amount of assemblage). Collected 1963 by M. S. Maxwell, Michigan State University. Source: Michigan XI: 276.

M-1531 (NMC-19): 3480±200; 1530 B.C. Charred animal fat dripped on sand, from 4 in. below surface, above permafrost.

Maxwell finds this a very satisfactory date. Elements of small cultural inventory recovered demonstrate the development of traits common in later Dorset sites. Typologically, it agrees well with slightly later assemblage of Killillugak site (*see* above).

Site OdPc-2

On terrace 29 to 31 ft above sea-level on west side of mouth of Kuuk River, Victoria Island (lat. 70° 34′ N, long. 112° 40′ W). Thin stratum of bones, stone chips, and Dorset artifacts over area 150 by 80 yd. This stratum overlies terrace gravel at depths ranging from surface to 7 in. No structures noted. Bone industry typical of early Dorset in eastern Arctic. Stone industry shows high frequency of large notched and stemmed end blades, a fact which may hint of southern affiliations (Lockhart River?). Collected 1966 by R. McGhee, University of Calgary. Source: Nat. Mus. Canada file.

GaK-1257 (NMC-161): 1860±100; A.D. 90. Charcoal from trench 1, square 15, located in area of greatest artifact and refuse concentration. From hearth area, depth 5 to 7 in., in lower levels of thin Dorset stratum. Hearth contained typical artifacts and fish bones. Will date earliest Dorset occupation of site and give date for Central Arctic Dorset bone industry similar to that of early Dorset in eastern Arctic but may be later in time. Will also be useful in comparisons with interior N.W.T. complexes. Estimated age 2,000 to 2,500 years.

McGhee comments that the date is more recent than the age estimate obtained by the comparison of the associated industry with dated Dorset culture components in the eastern Arctic. The acceptance of the date would imply that the 'early' phase of Dorset culture persisted to a later period in the central Arctic than in the eastern, an interpretation which is also suggested by the relative scarcity of Central Arctic components of more developed phases of Dorset culture. The shallow depth from which the sample was taken, however, suggests that contamination from floral, rodent, of frost activity may account for the lateness of the date.

Site OdPq-1

Northwest coast of Prince Albert sound, *ca.* 10 mi southeast of Holman Island settlement, Victoria Island (lat. 70° 36′ 30″ N, long. 117° 32′ W). Site is in boggy depression behind coastal cliffs and consists of four rather small Thule houses. Homogeneity of artifacts and size of middens suggest simple short occupation of relatively early Canadian Thule culture people. Collected 1966 by R. McGhee, University of Calgary. Source: Nat. Mus. Canada file.

GaK-1256 (NMC-160): 1820±80; A.D. 130. Wood, charcoal, and burned bone from house 4, square F3. Square F3 in midden area immediately in front of house 4, largest house on site. Depth 6 to 9 in. Will date occupation of house 4, and probably occupation of entire site. Should provide date for early phase of typical Canadian Thule culture. Estimated age 700 years.

McGhee does not find the date acceptable. The sample was closely associated with artifacts and represents cultural debris. There was no trace of an earlier occupation which could have caused contamination.

Acceptance of date would place Canadian Thule culture earlier in time than Birnirk stage at Point Barrow, considered to be ancestral to the Thule complex.

2. DISTRICT OF MACKENZIE

Jackson site

Police Point, 5 mi west of Cape Parry, south side of Amundson Gulf (lat. 70° 11′ N, long. 124° 44′ W). House ruin yielded pottery lamp with Barrow curvilinear decoration. Estimated age A.D. 1200. Collected 1963 by W. E. Taylor, Jr., Nat. Mus. Canada. Sources: Taylor 1964, 1965, 1967, n.d.; Michigan X: 142; Nat. Mus. Canada file.

M-1508 (NMC-6): 1190±100; A.D. 760. Carbon encrustation of inner and outer surfaces of large rim sherd with faint decoration of Barrow curvilinear style; taken from floor of house ruin (house 1) with Thule culture inventory. Upper part of house mound removed by bulldozer, leaving 3 to 6 in. of cultural debris and dirt on floor.

M-1509 (NMC-7) 1220±100; A.D. 730. Scraps of raw seal hide from floor of house yielding M-1508.

I-2052 (NMC-85a): 600±105; A.D. 1350. Willow twigs from culture debris resting on floor of house 1.

I-2088 (NMC-85c): 935±90; A.D. 1015. Wood fragment with adhering organic matter from cultural debris on floor of house 1.

On receipt of the two Michigan dates, Taylor noted that their acceptance would place the beginning of Thule culture much earlier than had been previously believed, and that it would have to be derived from early or middle Birnirk, rather than the close of Birnirk *ca.* A.D. 900. Also Thule movement from Alaska would now have to be considered earlier than previously postulated. Alternative suggestions were an A.D. 700 rather than 900 date for the termination of Birnirk, or an origin of Thule on the northeast coast of Alaska with a subsequent spread east and west. As none of these suggestions was satisfactory, additional samples were run, giving a total time span of more than 600 years from A.D. 600 to 1350. At present, Taylor prefers his original estimates of A.D. 1200.

Narrows site (KeNo-2)

On second highest recognizable delta formation on northeast side of north shore of narrows between Charlton Bay and Lockhart Bay at extreme east end of Great Slave Lake (lat. 62° 47′ N, long. 108° 56′ W). Late component of slate complex manifest all around north shore of east arm of Great Slave Lake. Complex clearly develops out of a lanceolate tradition akin to Artillery Lake complex and may represent parallel tradition to Lockhart complex. MacNeish's Taltheilei complex by redefinition is this slate complex and is probably ancestral or proto-Yellowknife Indian. Estimated age 1000 B.C. to A.D. 500. Collected 1966 by W. C. Noble, University of Calgary. Source: Nat. Mus. Canada file.

GaK-1258 (NMC-166): 1010±160; A.D. 940. Burned bone (caribou) from hearth in buried component 26 ft 9 in. above present Great

Slave Lake level. Overlain by 14 in. of laminated fine sands and rotted wood indicating overwash or ponding of water into subsequent deposition.

Noble finds date satisfactory and adds that on the basis of survey and excavation during 1967 he would now place Narrows component of Taltheilei complex between A.D. 500 and 1000, rather than what he previously estimated.

Site JcRw-3

North end of Fisherman Lake (lat. 60° 21.5′ N, long. 124° 50′ W). Collected 1966 by J. F. V. Millar and C. E. Eyman, University of Calgary. Source: Nat. Mus. Canada file.

GaK-1274 (NMC-201): 3780±160; 1830 B.C. Charcoal from square 54 at base of silty loess section on thin green glacial clay over till, coordinates 0.56 S, 6.32 W. Should date earliest occupation at site, an early Cordilleran component. Estimated age 9,000 to 11,000 years.

GaK-1275 (NMC-202): 8720±190; 6770 B.C. Charcoal from square 118, coordinates 9.98 S, 2.5 W in old hearth depression extending to clay and silt horizon. Should date hearth associated with early Plano component. Estimated age 6,000 to 7,000 years.

GSC-846 (NMC-203 and -204): 420±190; A.D. 1530. Burned wood from square 155, coordinates 5.0 S, 4.35 W, from number of preserved large pieces of wood in hearth lying high in the loess/silt. Samples should date latest Plano horizon. Estimated age 3,000 to 5,000 years.

Millar notes that GaK-1274 appears to be some 5,000 years too late, since stratigraphically it underlay GaK-1275; this seems to be slightly early but acceptable. Results of GSC-846 were obtained too late to be forwarded for submitter's comment for this publication.

3. DISTRICT OF KEEWATIN

Lamb Pegeelak site (JjLl-1c)

Oftedal Lake, 150 yd south of outlet (lat. 61° 37′ 55″ N, long. 97° 53′ 50″ W). Site is on small dune in which evidence of forest fire was found to overlie three or more hearths and culture material, possibly in two layers. Associated with hearths were scrapers, manufacturing debris, red ochre, and small side-notched points, suggesting age of more than 500 but less than 2,000 years. Collected 1964 by W. N. Irving, Nat. Mus. Canada. Sources: Bryson, Irving, and Larsen 1965; Irving, in press; Nat. Mus. Canada file.

I-2087 (NMC-81): 1110±90; A.D. 840. Charred wood (*Picea*?) from 6 in. below surface in buried layer of humus and charcoal, between two A_2 (podzol) soil horizons.

I-2089 (NMC-83): 2040±295; 90 B.C. Charcoal, mostly wood, from trench B from zone A, uppermost of two cultural layers below lower A_2 soil horizon.

Artifacts from zone A included flint chips, burned bone, and an end-scraper. From zone B, below, came two small side-notched points and some red ochre.

Irving notes that I-2087, which dates the forest fire, is nearly contemporary with other dates on forest fires from Ennadai Lake and Kazan River, more than 100 mi west. Age of more than 2,000 years for small projectile points in zone B (below level yielding I-2089) may be questioned, but comparative data are few and remote from this site.

Manico Point site

Manico Point, Southampton Island, Hudson Bay (lat. 63° 33′ N, long. 85° 39′ W). Peat bed, 2 to 5 cm thick, overlies thick bed of well-rounded gravel, apparently outwash, but underlies sand and coarse slabby gravel containing shells of *Mytilus edulis,* which in turn are overlain by beach ridges of 15-m (50-ft) terrace. Peat bed was probably below sea, and 15-m terrace was formed at time Dorset culture was present on island. Sadlermiut culture remains are on lower 7.5-m (25-ft) terrace, one abandoned Sadlermiut village site being only 1 mi away. Peat bed antedates and should provide maximum date for Sadlermiut culture on Southampton Island, as well as minimum date for Dorset culture. Collected 1957 by W. J. Wayne, Indiana Geological Survey. Sources: Michigan VII: 193; Bird 1953: 69.

M-1085: 2225±200; 275 B.C. Kelp peat from depth of 1.6 to 2.0 m below surface in exposure of Pleistocene glacial and marine sediments in wave-cut cliff.

Native Point sites

Forty miles south of Coral Harbour, southeast coast of Southampton Island, Hudson Bay (lat. 64° 10′ N, long. 83° 15′ W). Site T1, 1 mi east of Sadlermiut site of Tunermiut, extends over 20 acres, covering most of plateau 70 ft high. T3 site is 30 ft lower than T1, on old beach ridge, 40 ft high, at base of T1 plateau. Early Dorset period sites. Collected 1954 and 1955 by H. B. Collins, Smithsonian Institution. Sources: Collins 1956, 1956*a*; Pennsylvania IV: 8–9.

P-62: 2060±200; 110 B.C. Charred bone from test pit 6, northeast end of T1 plateau, on gravel ridge *ca.* 50 yd from Dorset midden. From hearth 14 in. below surface; hearth contained large quantities of burned mammal bones, blackened earth and gravel, and many bird bones.

P-74: 2183±122; 233 B.C. Burned bones, soil, and few small pieces of charcoal from hearth area test pit 8 at T1 site. Depth (base) 12 in.

P-75: 2508±130; 558 B.C. Burned bone from T1 site, trench A, square 1, level 2, depth 6 in. Trench A is 275 yd from test pit 8.

P-76: 2632±128; 682 B.C. Burned bone from T1 site, trench A, square 5, levels 2 and 3, depth 6 to 10 in. On basis of culture and stratigraphy, appears to be contemporaneous with P-75.

P-77: 2191±120; 241 B.C. Burned bone from T3 site, squares 1 and 9, level 2, depth 8 in.

Site JjLk-4

South shore of passage between Oftedal and North Henik lakes, about 1¼ mi west of easternmost narrows (lat. 61° 37′ N, long. 97° 45′ W). Site consists of five hearths on one stabilized dune recently subjected to deflation.

Around each hearth were found end scrapers and other artifacts. Hearths overlie buried charcoal layer, the result of forest fire, and some possibility of contamination from this source results. Collected 1964 by W. N. Irving, Nat. Mus. Canada. Sources: Irving, in press; Nat. Mus. Canada file.

I-2086 (NMC-80): 1630±135; A.D. 320. Wood charcoal from feature 2, exposed hearth in dune. Irving notes that this is one of the first three dates from the Barren Grounds, and that the associated artifacts represent a form of Archaic culture.

II. WESTERN CANADA

A. British Columbia

Beach Grove site (DgRs-1)

Near base of Point Roberts Upland, Delta Municipality (lat. 49° 02′ N, long. 123° 04′ W). Shell midden with depressions which may indicate former house locations. Occupied while area was still an island and a winter village component of Marpole phase, one of the richest periods in cultural sequence of Fraser River Delta area. Previous age determinations on samples from Marpole phase have ranged from 8th century B.C. to 2nd century after Christ. Collected 1961 by D. N. Abbott for Wilson Duff, Provincial Mus. of British Columbia (now at University of British Columbia), and 1962 by P. D. Harrison and J. H. Sendey for C. E. Borden, University of British Columbia. Sources: University of Washington III: 503; Nat. Mus. Canada file.

UW-43: 1540±130; A.D. 410. Charcoal from stratum 18 ft north and 64 ft west of datum, 190 cm below surface, containing dark charcoal-stained soil with pea gravel and clam-shell fragments.

UW-44: 1600±120; A.D. 350. Charcoal from stratum 18 ft north and 6 to 7 ft west of datum, 107 cm below surface, containing clay, clam, cockle, and wood fragments.

GSC-440 (NMC-47): 1730±130; A.D. 220. Charcoal from just under burial 17 within shallow pit made for that burial, located 26 ft north and 3 ft east of datum, at depth of 6 ft 10 in. below surface.

Borden comments that the University of Washington dates indicated that the Marpole phase had lasted considerably longer than had been expected. Duff notes that the GSC date confirms this conclusion, and further casts doubt on previous estimates of the age of the Marpole component of the phase. He regards it as unlikely that the maximum age of phase is greater than perhaps 2,400 years.

Courtenay sites

Group of mounds and middens located between 1 mi and 3 mi northwest (incorrectly given as "northeast" in Saskatchewan II: 79) of Courtenay, Vancouver Island (lat. 49° 42′ N, long. 125° 00′ W to lat. 49° 43′ N, long. 125° 02′ W). Collected 1957 and 1959 by K. Capes, Nat. Mus. Canada. Sources: Capes 1964; Saskatchewan II: 79; Saskatchewan III: 76–7.

S-48: 4550±200; 2600 B.C. Charcoal from 6 in. below floor at east end of dirt and stone mound (50 ft × 25 ft × 3 ft) which covered unique stone border arrangement, at site between Tsolum River and Headquarters road, which contained thirty low dome-shaped mounds.

S-102: 1650±70; A.D. 300. Charcoal from 12 to 18 in. below surface of 2 ft high mound.

S-103: 3750±80; 1800 B.C. Charcoal from 2.5 to 3 ft below surface of same 2 ft high mound.

S-104: 400±60; A.D. 1550. Charred wood from 3 ft thick bottom layer of Tsolum River midden, overlain by 3.5 ft of river silt covered by forest.

S-105: 380±70; A.D. 1570. Charcoal from Sandwich shell midden, 2 to 3 ft thick, covered by trees *ca.* 100 years old. Sample from pit 8 to 24 in. below surface.

Capes is not able to account for the considerable age difference between samples S-102 and S-103 from same mound. Dates of S-104 and S-105 and their associated artifacts accord with age (660±130) and cultural complex of the Stselax village, British Columbia (*see* below).

Cow Springs site (EdRk-5)

Lochnore–Nesikep Creek area of Fraser River (lat. 50° 32′ N, long. 121° 46′ W). Single house pit site with two distinct components separated by sterile gravels and sands. Probably one of the more recent sites in the Lochnore–Nesikep Creek sequence, although assemblage lacks some items normally associated with historic-age sites. Collected by M. Suttles for D. Sanger, University of Washington (now at Nat. Mus. Canada). Source: Nat. Mus. Canada file.

GSC-405 (NMC-51): 310±130; A.D. 1640. Charred log from test pit in east lip of house pit at depth of 92 cm below surface. Sealed-in zone II deposits, from which sample taken, exhibited remarkable preservation, including one-piece birchbark basket virtually identical in design to those illustrated for the ethnographic Thompson Indians. Absolute date on this assemblage would indicate something of the antiquity of manufacture of these baskets and would provide a clue to the date of large collection of artifacts removed from burial ground EdRk-3, also in Lochnore–Nesikep Creek sequence.

Sanger notes that the date is more recent than estimated and that a portion of the same sample has given dates of A.D. 1175±95 (GX 406-2) and A.D. 1125±85 (GX-406), which are much closer to estimated age of A.D. 1200.

Drynoch Slide site (EcRi-1)

Thompson River valley, south-central British Columbia (lat. 50° 20′ N, long. 121° 24′ W). Cultural material in windblown sands resting directly on coarse gravels, presumably dating from aggrading period of Thompson River. Overlain by ash level, identified as Mazama ash dated at 6,600 or more years. Ash is overlain by extensive mud slide, dated by radiocarbon to 3175±150 years (I-462). Diagnostic feature of cultural deposit is presence of microblade, probably oldest found in southern British Columbia to date. Collected 1965 by D. Sanger, University of Washington (now at Nat. Mus. Canada). Sources: Sanger 1967; Nat. Mus. Canada file.

GSC-530 (NMC-84): 7530±270; 5580 B.C. Composite of numerous small pieces of charcoal scattered throughout midden of fish remains and artifacts. Date will provide estimate for age of ash as well as another early date for presence of microblades in British Columbia.

Sanger notes that the date is in general accord with geological context and provides a date for the presence of microblades in southern British Columbia.

Esilao site (DjRi-5)

Fraser Canyon, *ca.* 110 mi above mouth of river (lat. 45° 33′ N, long. 121° 24′ W). Deeply stratified site. In 18th and 19th centuries was location of Esilao, pit house village of the Tait, easternmost division of the Coast Salish. Collected 1963 by D. H. Mitchell, D. L. Keenlyside, and M. Suttles for C. E. Borden, University of British Columbia. Sources: Michigan X: 137–9; Nat. Mus. Canada file.

M-1543 (NMC-29): 2000±120; 50 B.C. Charcoal from single large piece of charred log located at 29 ft 4 in. S, 7 ft E from Datum A. Depth 102 in. below Datum Plane A, 116 in. from surface. Log originated *ca.* 5 in. below floor of pit house destroyed by fire. Unless log is part of roof timber that penetrated underlying stratum on falling, it should antedate burned building.

M-1544 (NMC-30): 4420±160; 2470 B.C. Charcoal from hearth in southeast corner of square 30 to 35 ft S, 10 to 25 ft W. Depth from Datum Plane A 123 in. *Ca.* 19 ft west of provenience of M-1543 and approximately 2 ft deeper, strata being relatively horizontal. Though still rare, ground slate knives are present at this level.

M-1545 (NMC-31): 4360±160; 2400 B.C. Charcoal from 30 ft 6 in. S, 10 ft 10 in. W, depth 146 to 148 in. from Datum Plane A. Hearth from which sample originated was 8 in. below bottom of deep intrusive pit which extended 4.5 ft downward from more recent horizon at 84 in. beneath datum plane. Though no ground slates were in immediate association with sample, partially ground slate artifacts occur sporadically at this level *ca.* 20 ft to east.

M-1546 (NMC-32): 4880±180; 2930 B.C. Charcoal from 25 ft S, 17 ft 2 in. E.

Depth from Datum Plane A 180 in., from surface 165 in. Collected in deep test shaft some 28 ft east of location of M-1545 and *ca.* 32 in. deeper. Approximately 3 ft below earliest ground slate.

M-1547 (NMC-33): 5490±500; 3530 B.C. Charcoal from small concentration in compact moist yellow gravel at *ca.* 26 ft 5 in. S, *ca.* 15 ft 9 in. E, depth 225 in. below Datum Plane A, 213 in. below surface. Horizontal provenience similar to that of M-1546 but 45 in. deeper. Chipped stemmed projectile point was found just below spot from which sample was taken.

GSC-455 (NMC-65): 2180±130; 230 B.C. Charcoal from 26 ft 7 in. S, 1 ft 9 in. E, depth 42 in. below surface. Will date component midway between M-1543 and 18th century. Estimated age 2nd half of 1st millenium.

GSC-444 (NMC-66): 2080±130; 130 B.C. Charcoal from 27 ft 3 in. to 28 ft 3 in. S, and 11 ft 5 in. to 13 ft 8 in. E, depth 99 to 102 in. below surface. From stratum 3½ ft below that which yielded GSC-455, and above level of M-1543.

GSC-456 (NMC-67): 3790±130; 1840 B.C. Charcoal from 33 ft S, 12 ft 7 in. W, at depth of 69 in. below surface. About 1½ ft above position of M-1544.

GSC-448 (NMC-68): 2640±140; 690 B.C. Charcoal from 34 ft to 34 ft 3 in. S, 17 ft to 17 ft 6 in. W, at depth of 35 in. below surface. From just below massive gravel slide, about 4½ ft above provenience of M-1544 and 3 ft above level of GSC-456. Should date hearth in level containing well-made adze blades and sawn steatite, located above deposits of the Eyem phase.

Borden's comments on the two groups of samples can be summarized as follows: original estimates were too conservative, because of the lack of dated assemblages for cross-dating. Earlier dates had suggested that ground slate knives were introduced into the area a little before 400 B.C., but dates on M-1544, M-1545, M-1547, and GSC-456 indicate their appearance during Eyem phase at *ca.* 2500 B.C. This sequence of dates together with thickness of deposits above sample GSC-456 suggests a time span for Eyem phase of *ca.* 3550 to 1100 B.C. Succeeding Skamel phase is dated by M-1543 and GSC-444, charred timbers from burned Skamel phase house. Sample GSC-455, from deposits overlying Skamel phase, appears to be too early. A possible explanation is that during excavations for a new house adjacent to the burned one, older material was brought to the surface and dumped into the pit of the burned structure.

Garden Island site (GbTo-23)

Venn Passage, Prince Rupert (lat. 54° 19′ 05″ N, long. 130° 23′ 15″ W). Shell midden covering small island (50 by 250 ft) in Coast Tsimshian area. Midden is entirely prehistoric. Collected 1966 by G. MacDonald and P. Monahan, Nat. Mus. Canada. Source: Nat. Mus. Canada file.

GSC-744 (NMC-156): 1970±130; 20 B.C. Charcoal from trench 2, 0.2 ft S, 4.2 ft W, depth 9.0 ft. Lowest cultural level, overlying peat deposit and blue marine clay. Estimated age 1,500 to 2,000 years.

GaK-1250 (NMC-157): 2520±100; 570 B.C. Peat from trench 2 0.5 ft W, 3.5 ft S, depth 9.4 ft. From peat horizon which underlies a number of middens in Venn Passage, Prince Rupert Harbour area. Estimated age 2,000 to 2,500 years.

GaK-1251 (NMC-159): 1660±80; A.D. 290. Charcoal from trench 2, 0.2 ft S, 9.0 ft W, depth 7.5 ft, immediately below second humus layer in area of burned shell. Artifact concentrations and hearth stones frequent in humus, but no samples adequate for dating. Estimated age 1,200 to 1,500 years.

MacDonald comments that approximately two thousand artifacts and forty human burials were recovered from this site. Most of them fell between these two dates, at a time which appears to be in accord with components and events in more southerly coastal sites.

Great Fraser midden

See Marpole site.

Hagwilget site (GhSv-2)

Junction of Bulkley and Skeena Rivers, northern British Columbia (lat. 55° 15′ 20″ N, long. 127° 36′ 05″ W). Stratified fishing station in Bulkley Canyon, inhabited in past century by both Gitksan and Carrier bands. Collected 1966 by C. J. Turnbull for G. MacDonald, Nat. Mus. Canada. Source: Nat. Mus. Canada file.

GSC-746 (NMC-158): 3430±130; 1480 B.C. Charcoal from trench 1, feature 1, 2.0 ft E, 0.6 ft N, depth 5.5 ft. From hearth feature containing lithic artifacts and other cultural material. Importance of site is due to its location on the present boundary between Tsimshian and Athapaskan-speaking peoples, and to numerous indications that the well-worked stratum in which the hearth lies is far above the base of the cultural deposit.

MacDonald finds the date acceptable.

Hope site (DiRi-1)

Left bank Fraser River at Hope (lat. 49° 23′ N, long. 121° 26′ W). Collected 1956 by C. E. Borden, University of British Columbia. Source: Saskatchewan II: 78–9.

S-62: 2270±100; 320 B.C. Charcoal from hearth at 5.5 ft below surface and 6 in. above sterile soil. Thin ground slate knives found next to a hearth which yielded sample may have been among first such implements used in the Fraser valley. Similar knives begin to appear slightly earlier in sites at mouth of river (*see* Locarno Beach and Whalen sites, below). Charcoal of S-62 probably antedates beginning of large pit house village that existed at site in recent times.

Lehman site (EdRk-8)

Fraser River valley (lat. 50° 32′ N, long. 121° 46′ W). Apparent house pit site, assumed at present to be two components. Collected 1964 by D. Sanger, University of Washington (now at Nat. Mus. Canada). Sources: Sanger 1967; Nat. Mus. Canada file.

GSC-404 (NMC-52): 2180±150; 230 B.C. Charcoal (combined sample) from uppermost few centimetres of lower of two distinct geological strata.

I-2367 (NMC-120): 6650±110; 4700 B.C. Mixed food bones (mostly deer) from lower component in various test trenches. Sanger notes that zone I, or upper component, lacks microblades; associated artifacts are quite similar to those at Lochnore Creek site (*see* below). Date for lower component is older than expected but still plausible.

Locarno Beach site

Vancouver (erroneously placed on Vancouver Island *in* Saskatchewan I: 34). Submitted (no date of collection) by C. E. Borden, University of British Columbia. Source: Saskatchewan I: 34.

S-3: 2430±160; 480 B.C. Charcoal from 95 in. below surface.

Lochnore Creek site (EdRk-7)

Fraser River between Lytton and Lillooet (lat. 50° 32′ N, long. 121° 46′ W). Assemblage predates introduction of small side-notched projectile points but contains other traits found in historic sites. Microblades, absent in historic assemblages, are present in small percentages and appear to be losing popularity. House pits are probably about as old as any known from the Canadian Plateau. Collected 1964 by D. Wyatt for D. Sanger, University of Washington (now at Nat. Mus. Canada). Sources: Sanger 1966, 1967; Nat. Mus. Canada file.

GSC-407 (NMC-50): 2670±130; 720 B.C. Charred log from bottom of house pit 2 at depth of 1.85 to 2.00 m in most recent of three components.

I-2085 (NMC-79): 1610±95; A. D. 340. Charred wood from floor near lip of house pit 4 at depth of 63 cm below ground surface.

Sanger believes GSC-407 date to be reasonable but I-2085 determination to be much too late.

Marpole site (DhRs-1)

Also called Great Fraser midden and Vancouver shell midden. Marpole district, southern limits of Vancouver (lat. 49° 12′ N, long. 123° 07′ W). Very rich culture associated with site, represents climax in cultural development of Fraser Delta. Collected (date not given) by T. H. Ainsworth, Vancouver City Mus. and in 1954 and 1957 by C. E. Borden, University of British Columbia. Sources: Saskatchewan I: 34; Saskatchewan II: 77; Lamont IV: 1328.

S-17: 2015±166 and 1880±180, average 1950±125; 1 B.C. Charcoal from depth of 55 to 65 in.

S-17bis: 2350±60; 400 B.C. Charcoal from 55 to 65 in. below surface, in lowermost 10 in. of shell midden.

S-93: 1780±60; A.D. 170. Charcoal from bottom of shell midden, depth 41 in., in a different location from the one which yielded S-17. Inferior stratum was stained but was otherwise sterile subsoil.

L-337: 2100±90; 150 B.C. Hearth charcoal from depth of 9 ft in midden, refuse containing clam and mussel shell and artifacts. Sample associated with Mongoloid remains.

Borden refers to another date of 2900±170, which is now presumed to be erroneous. The date of S-93 which appears reasonable when considered in terms of the overall cultural development of the Fraser Delta region was taken from western extremity of site, while deeper and presumably older portions of site lay farther east.

Milliken site (DjRi-3)

Fraser Canyon near Yale (lat. 49° 33′ N, long. 121° 24′ W). Deeply stratified site. Upper 32 ft include eleven soil zones, of which seven are culture bearing. Collected 1956, 1957, and 1959 by C. E. Borden, in 1960 by Borden and P. D. Harrison, and in 1961 by Borden, D. Rice, T. Denton, and D. MacLeod, University of British Columbia. Sources: Borden 1961; Saskatchewan II: 78; Saskatchewan III: 77; Michigan X: 136–7; Nat. Mus. Canada file.

S-47: 8150±300; 6200 B.C. Small bits of charcoal from human occupation layer (zone G) embedded in sand laid down by Fraser River when flood level was about 50 to 60 ft higher than present normal high water. Layer is under 17 to 18 ft of deposit.

S-61: 7350±150; 5400 B.C. Charcoal from occupation layer (zone E), above and separated from zone G by 2 to 3 ft of cemented gravel (zone F).

S-112: 2360±60; 410 B.C. Charcoal from zone C, separated from zone E by stream-laid gravels of zone D, and 5 to 6 ft below surface, in lower part of topsoils. This stratum contains thin ground slate knives similar to those found at Hope site, 17 mi downstream (*see* above).

S-113: 9000±150; 7050 B.C. Charcoal from zone I, 25 ft below surface, separated from zone G by stream-laid gravels of zone H. Layer contained vegetable food remains, stake holes, and artifacts including a projectile point.

M-1511 (NMC-9): 570±100; A.D. 1380. Charcoal covering burial 7 in upper part (zone A) of topsoil at 6 ft 5 in. to 6 ft 7 in. S, and 17 ft to 19 ft E from Datum A. Depth 29 to 32 in. from surface, and 27 to 30 in. below Datum Plane A plus 2 ft. Nineteenth century ethnographic information indicates Tait and adjacent Fraser Valley groups placed dead in mortuary houses. Burial 7, combining inhumation with partial cremation, seems to predate introduction of mortuary houses. Evidence from Fraser mouth indicates that midden burial, customary on coast in millenium preceding our era, was continued in following centuries but was no longer practised by end of the 13th century, possibly because it was replaced by mortuary houses. If such houses subsequently spread to Tait area, date of burial 7 would be *ca.* 300±100 years ago. Alternatively, mortuary houses may have displaced inhumation earlier in the Tait area.

M-1512 (NMC-10): 2790±130; 840 B.C. Charcoal from lower part (zone CO) of topsoil at 18 ft 7 in. to 18 ft 11 in. S, 6 ft to 6 ft 3 in. E from Datum A, depth 56 to 59 in. from surface and 69 to 72 in. below Datum Plane A plus 2 ft. Near bottom of topsoil. Associated with earliest disc beads at site. Some carved steatite animal figurines were found a few feet away. Though slightly higher, these appear to belong to same general period. Estimated age 2,650±200 years, since ground slate completely absent from this level and those levels immediately above. Dates on S-62 (Hope site, above) and S-112 (this site) indicate such implements were present in this part of Fraser Valley by 4th century B.C.

M-1513 (NMC-11): 2800±130; 850 B.C. Charcoal from bottom of zone C in topsoil, at 2 to 4 ft S, 18 to 19 ft E from Datum A, depth 72 to 73 in. below surface and 68 to 69 in. below Datum Plane A plus 2 ft. From hearth area underlain by thin layer of yellow sand, which in turn rests directly on surface of gravel of zone D. Should date occupation on top of gravel prior to or contemporary with beginning of deposition of 6 ft of fine sandy loam which constitutes topsoil at site. Start of deposition of this fine, largely windblown material may coincide with termination of Hypsithermal and beginning of modern climatic conditions which Heussey sets at *ca.* 1100 B.C. for southwest British Columbia. Estimated age 2950±200 years.

GSC-459 (NMC-69): 7190±150; 5240 B.C. Charcoal from zone D, at 7 ft N, 11 ft 6 in. E, at depth of *ca.* 9½ ft below surface. Zone D consists largely of sterile gravels probably laid down during period of last major eruptions of Mt. Mazama, which have average date of *ca.* 4500 B.C.

Seam of volcanic ash attributed to Mt. Mazama traverses zone D at some parts of site. Sample will help date assemblage found immediately on surface of zone D, which strongly resembles materials from preceding Milliken phase and in some respects materials of the later Eyem phase at the nearby Esilao site (*see* above). The name 'Mt. Mazama' has been provisionally assigned to this apparently transitional phase.

Borden comments that the date for M-1511 suggests that, as a result of coast influence, mortuary houses were adopted in this area at a date later than that of the sample. M-1512 and M-1513, nearly the same, do in fact coincide with the end of the Hypsithermal. GSC-459 was earlier than expected and suggests that fan gravels of zone D overlying cultural stratum zone E built up more rapidly than was assumed. Material at surface of zone D also probably dates earlier than estimated. Remaining dates are consistent both with stratigraphy and with geological evidence.

Musqueam North site

Musqueam Indian Reserve, Fraser River (lat. 49° 13′ 30″ N, long. 123° 11′ 45″ W). Village site representing pure component of Marpole phase. Collected 1959 by C. E. Borden, University of British Columbia. Source: Nat. Mus. Canada file.

GaK-1283 (NMC-193): 2350±80; 400 B.C. Charcoal from hearth in lowermost stratum of house, underlain by sterile gravel. Superior strata consist of about 20 in. of successive hearths and other house floor deposits, topped by 10 in. of cultivated soil. Estimated age probably older than 2,000 years.

Borden comments date is about as expected. Must be considered key date for Marpole phase, since results of three measurements on S-17 from type site (*see* Marpole, above) were very erratic.

Natalkuz Lake site

North shore of Natalkuz Lake. Collected (date not given) by C. E. Borden, University of British Columbia. Sources: Borden 1952; Saskatchewan I: 34.

S-4: 2415±160; 465 B.C. Charred pine cones from bottom of hearth pit of circular lodge.

Pender Island Canal site (DeRt-2)

North Pender Island, Gulf of Georgia (lat. 48° 45′ 50″ N, long. 123° 15′ 20″ W). Deeply stratified shell midden, *ca.* 400 yd long by 20 yd wide, 7 to 8 ft deep. Bottom stratum associated with soapstone artifacts of Gulf Islands complex, thought to be characteristic of Early Maritime (formerly 'Eskimoid') culture of Gulf of Georgia area. Culture known only from Locarno Beach site (*see* above) and lower levels of Whalen site (*see* below). May have centred in Gulf Islands. Canal site may be typical. Temporal position in Fraser Delta uncertain, since dates bracketed by younger and older ones from Marpole phase in same area. Collected 1958 by J. E. M. Kew for W. Duff, Provincial Mus. of British Columbia (now at University of British Columbia). Sources: Borden 1954, 1962; Duff 1955; Michigan X: 137.

M-1515 (NMC-13): 2200±120; 250 B.C. Charcoal from lowest of three levels in second test pit, depth 7 ft 1 in. below datum. Dating of this sample from site in islands may clear up confusion surrounding temporal position of this complex.

Duff finds this date reasonable and notes that it adds to recent indications that both Early Maritime and especially Marpole phases are less ancient than they were formerly thought to be.

Sandwich midden

See Courtenay sites.

Stselax village

Musqueam Indian Reserve (lat. 49° 13′ N, long. 123° 12′ W). About 5 ft of stratified house deposits, Coast Salish culture. Collected 1951 by C. E. Borden, University of British Columbia. Source: Saskatchewan II: 77–8.

S-20: 660±130; A.D. 1290. Charcoal from charcoal and black-ash layer at base of house floor deposits, accumulated during occupation of houses built and rebuilt on same spot.

Borden comments that the date marks the approximate beginning of Stselax village and probably also of the developed Coast Salish culture phase. Data from strata overlying this charcoal suggest relative cultural stability until white contact, around A.D. 1800.

Tsolum River midden

See Courtenay sites, above.

Vancouver shell midden

See Marpole site, above.

Whalen site

West shore of Boundary Bay in Fraser Delta (lat. 49° 00′ N, long. 123° 02′ W). Two components. Lower is Whalen I, which is distinct from the culture of the apparently somewhat later Marpole phase (*see* Marpole site, above), but closely related to the culture of the Locarno Beach site (*see* above). Upper level, Whalen II, contrasts sharply with Whalen I and seems more directly ancestral to recent Coast Salish culture of this region (*see* Stselax village). Whalen II culture was almost certainly introduced by immigrants to the Fraser Delta. Collected 1949 by C. E. Borden, University of British Columbia. Source: Saskatchewan II: 77.

S-18: 2450±160; 500 B.C. Charcoal from lower horizon, depth 10 to 12 ft.

S-19: 1580±140; A.D. 370. Charcoal from upper horizon, depth 3 to 4 ft.

Borden notes that the S-18 date suggests virtual contemporaneity of Whalen I and Locarno Beach.

Site DfRu-13

Montague Harbour, Galiano Island (lat. 48° 53′ 25″ N, long. 123° 24′ 0″ W). Stratified shell midden with three cultural horizons. Montague

Harbour, levels numbered I to III from bottom to top. These represent respectively the Locarno Beach phase, the Marpole phase, and Coast Salish. Collected 1964 by D. H. Mitchell, J. Sendey, and T. Moore for W. Duff, Provincial Mus. of British Columbia (now at University of British Columbia). Source: Nat. Mus. Canada file.

GSC-436 (NMC-42): 730±130; A.D. 1220. Charcoal from Montague Harbour III level, test cut 1, 13 ft 4 in. S, 2 ft E, in dark soil with scattered shell and charcoal, depth 60 in. below surface.

GSC-406 (NMC-43): 2890±140; 940 B.C. Charred wood from Montague Harbour I level, test cut 1, 3 ft S, 2 ft E, below water table. at depth of 80 in. below surface. Layer of compact black soil containing little shell but considerable bone.

GSC-437 (NMC-44): 3160±130; 1210 B.C. Charcoal from Montague Harbour I level, test cut 2, 0 to 5 ft S, 3 to 5 ft E, in stratum of black humus with charcoal and gravel at depth of 94 in. below surface.

GSC-423 (NMC-45): 790±130; A.D. 1160. Charcoal from Montague Harbour III level, test cut 3, 1 ft S, 4 ft E, in black humus, yellow sand, and scattered shell fragments at depth of 88 in. below surface.

D. H. Mitchell (University of Victoria) notes that since Montague Harbour I materials seemed to align the culture with another Locarno Beach phase site, Pender Island Canal (*see* above), it was originally thought that samples from DfRu-13 would range back 2,000 or 2,500 years. Present dates must alter the opinion of the age of Locarno Beach phase sites but do not mean a substantial realignment in thinking.

B. ALBERTA

Caribou Island site (GbOs-100)

Near Moose Lake, east-central Alberta (lat. 54° 15′ N, long. 110° W). Site yielded long palaeoclimatological and archaeological sequence for postglacial times, commencing with raised beach deposits yielding only unifacially flaked cobble tools. Early surface scoured by prevailing wind from southeast. Later, prevailing wind shifted to northeast and deposited parabolic dunes on the island. New types of artifacts found in dune deposits. Increasing moisture stabilized the dunes and formed a soil, which yielded the earliest projectile points. The dunes were later re-activated and finally reconsolidated. Collected 1965 by D. Moore for A. L. Bryan, University of Alberta. Source: Nat. Mus. Canada file.

GSC-660 (NMC-97): 4200±140; 2250 B.C. Charcoal from possible hearth in stratum IV, square JJ50, at depth of 40 to 50 cm. Should date initiation of dune reactivation. It is possible that the buried soil was truncated at time of dune reactivation and that the charcoal was originally in the soil. However, it appears more likely that the fire was built on or above the palaeosol after the dune had reactivated. Estimated age 3,500 years, because of Duncan points in the yellow sand.

Bryan notes that the date correlates quite well with previous estimate, as the Duncan points occur above the dated sample.

Elkwater Lake site (DjOn-100)

Elkwater Lake, Cypress Hills region (lat. 49° 48′ N, long. 110° 20′ W). Site on surface of large slump block, with about 30 cm of occupational deposits. Collected 1965 by R. Bonnichsen, University of Alberta. Source: Nat. Mus. Canada file.

GaK-1273 (NMC-197): 1260±100; A.D. 690. Burned soil possibly containing charcoal from square 54Q, 45 to 110 cm W, 65 to 105 cm S, depth 22 cm below surface. Most common projectile point at 20-cm level is Pelican Lake type. Estimated age 2,500 years.

Bonnichsen has rechecked the depths of the points most closely related to the samples and has determined that three, which are rather aberrant in terms of classic point types, came from nearby at the same vertical depth as the sample. They appear to be most closely related to Besant points, but also have affinities to Hanna points. The date would tend to support the Besant identification.

Fullerton site (FfPi-100)

Near Wetaskiwin, central Alberta (lat. 52° 58′ N, long. 113° 28′ W). Site contains evidence for intermittent occupation from about 7,000 years ago up to historic times by small hunting and/or family groups. Location is on top of large stabilized parabolic dune in an old lake bed, which still contains many sloughs. Collected 1965 by F. Taylor for A. L. Bryan, University of Alberta. Source: Nat. Mus. Canada file.

GSC-641 (NMC-98): 1230±130; A.D. 720. Charcoal from intrusive pit dug from level containing Oxbow projectile points, in square B, depth 55 to 70 mm below surface. Because of the absence of physical stratigraphy, identification of 'level' from which pit was excavated is subject to error, but pit is definitely no earlier than Oxbow times. Estimated age 3,500 to 5,000 years ago.

Bryan comments that surprisingly recent date has explained certain anomalies, but has shown that tracing any one assemblage through the site will be even more difficult than suspected. Intrusion of pit probably began at a higher 'level' than suspected. Unfortunately there are no other suitable samples to use as a check.

Kajewski site (DjOn-102)

Cypress Hills (lat. 49° 35′ N, long. 110° 20′ W). Probably three components. Material recovered is largely artifacts made from quartzite cobbles and flakes. Collected 1966 by N. Deemer for R. Bonnichsen, University of Alberta. Source: Nat. Mus. Canada file.

GaK-1272 (NMC-196): 3100±80; 1150 B.C. Charred bone from square 49D.0, from surface of buried slump block in area of dense occupation. From lowest culture-bearing level, associated with cobble choppers, a projectile point with basally thinned stem, and a triangular projectile point. Lowest level is dense living floor of occupational debris. Estimated age 4000 B.C.

Muhlbach site (FbPf-100)

Near Stettler, central Alberta (lat. 52° 15′ N, long. 112° 50′ W). Bison trap of Besant culture. Collected 1965 by J. Bellamy for R. Gruhn. University of Alberta. Sources: Gruhn 1965; Nat. Mus. Canada file.

GSC-696 (NMC-99): 1270±150; A.D. 680. Charred bone from square B14, bone bed matrix (zone C). Depth approximately 50 cm below surface. Estimated age about A.D. 350.

Gruhn notes that the zone was saturated by solution from overlying bed of manure, so that sample could have been contaminated. Date is inconsistent with other radiocarbon dates of between A.D. 300 and A.D. 400 from other Besant sites in Alberta and Saskatchewan.

Old Women's Buffalo Jump (EcPl-1)

Fifty miles south of Calgary (lat. 50° 28′ N, long. 113° 53′ W). Collected 1958 by N. Richards and R. G. Forbis, Glenbow Foundation. Calgary. Sources: Forbis 1962; Saskatchewan II: 79–80; Saskatchewan III: 76.

S-87: 1100±80; A.D. 850. Charcoal from square A-5, layer 13, composed principally of decomposed and matted hair, hide, and buffalo bones resembling compressed peat in colour and consistency. Contained small flecks of charcoal and small lenses of burned bone. Above and below were soil zones, each averaging *ca.* 1 ft in thickness. Layer 13 is *ca.* 7 to 8 ft below surface.

S-89: 1020±80; A.D. 930. Burned bone from square B-5, also in layer 13.

S-90: 1650±60; A.D. 300. Burned hair, hide, and bones from layer 17, square B-0, 10 ft below surface.

S-91: 1840±70; A.D. 110. Burned and reburned bone in soil matrix from layer 25, square B–0, *ca.* 15 ft below surface.

Noting that all dates are stratigraphically concordant with each other, Forbis comments that those from layer 13 approximate the time when the small projectile point tradition began at the Old Women's Buffalo Jump. These dates are consistent with the estimate that the Late Prehistoric period (of which small points are the principal diagnostic) began *ca.* A.D. 500 (Mulloy 1958) and with the estimates of MacNeish (1958) for small points in southeastern Manitoba. They conflict, however, with Wettlaufer's (1955) estimate for the appearance of small points at Mortlach site in Saskatchewan. Layer 17 contains points similar to, if not identical with, Besant points at Mortlach (*see* below, Saskatchewan). Diagnostic specimens from layer 25 appear to have no known cognate forms at Mortlach or at other late localities in the northern Plains.

South Battle Creek site (DjOm-113)

Head of south arm of Battle Creek (lat. 49° 37′ N, long. 110° 12′ W). Fifty centimetres of stratified deposits, occupation beginning about 8,000 years ago. Collected 1966 by N. Zierhut for R. Bonnichsen, University of Alberta. Source: Nat. Mus. Canada file.

GaK-1269 (NMC-198): 140±70; A.D. 1810. Charcoal from square 5A, 132 to 145 cm N, 9 to 14 cm W, depth 3 to 6 cm. From hearth area in last occupation associated with small Plains side-notched points, choppers, and scrapers. Estimated age 200 years.

Bonnichsen finds the date acceptable.

C. SASKATCHEWAN

Avonlea site

Near Avonlea (lat. 50° 01′ N, long. 105° 00′ W). Artifacts and bones are concentrated over an area 80 ft in diameter and occur between 8 and 16 in. below the surface. Overlain by aeolian fine sand. Collected 1956 by B. McCorquodale; submitted by R. W. Nero, Saskatchewan Mus. Natural Hist. Source: Saskatchewan II: 80.

S-45: 1500±100; A.D. 450. Charred bone from concentration of burned bone fragments associated with stone artifacts. No levels of occupation occur above or below the dated material.

Chamberlain site

Near Chamberlain (lat. 50° 50′ N, long. 105° 31′ W). Two zones separated by 12 in. of sterile sand, silt, and clay with pebbles; both zones associated with pottery and organic matter. Sterile sediments suggest change in climate. Collected 1960 by D. M. Lane for E. A. Christiansen, Saskatchewan Research Council. Source: Saskatchewan III. 77–8.

S-121: 260±50; A.D. 1690. Charcoal from upper zone.

S-120: 780±50; A.D. 1170. Charcoal from lower zone.

Gull Lake site

Prehistoric bison drive near Gull Lake (lat. 50° 00′ N, long. 108° 30′ W). Site had at least 16.5 ft of occupation material. Layer 21 and layer 24b below it (9 ft below surface) contained quantities of butchered bison bone and stone artifacts. These were overlain by a sterile zone, above which were upper layers of bone. Collected 1960 by T. F. Kehoe, Saskatchewan Mus. Natural Hist. Sources: Kehoe and McCorquodale 1961; Saskatchewan III: 78.

S-150: 1165±80; A.D. 785 Charcoal from layer 21.

S-149: 1220±80; A.D. 730. Charcoal from layer 24b.

Kehoe notes that layer 21 contained bones of *Bison bison athabascae* but apparently no pottery, while layer 24b contained charred bones of butchered bison (race undeterminable), stone projectile points later than Classic Avonlea, and apparently no pottery. Probably, therefore, samples date occupations of non-ceramic, bison hunting peoples of Late Prehistoric period (small side-notched tradition).

Long Creek site

Long Creek valley (lat. 49° 1′ 50″ N, long. 103° 0′ W). Nine levels of occupations have been recognized from surface to depth of 12 ft. Collected (date not given) by B. Wettlaufer, B. McCorquodale, A. Swantson, and B. Shier, Saskatchewan Mus. Natural Hist. Sources: Wettlaufer and Mayer-Oakes 1960; Saskatchewan III: 75–6.

S-49a: 2230±100; 280 B.C. Charcoal from level 4 (upper). Associated culture: Pelican Lake.

S-49b: 3710±70; 1760 B.C. Charcoal from level 4 (lower). Associated culture: Pelican Lake.

S-63a: 3370±115; 1420 B.C. Charcoal from level 5 (upper). Associated culture: Hanna.

S-63b: 4520±170; 2570 B.C. Charcoal from level 5 (lower). Associated culture: Hanna.

S-50: 4620±150; 2670 B.C. Charcoal from level 7. Associated culture: Oxbow.

S-52: 4620±80; 2670 B.C. Charcoal from level 8 (upper). Associated culture: Oxbow.

S-53: 4650±150; 2700 B.C. Charcoal from level 8. Associated culture: Oxbow.

S-54: 5000±125; 3050 B.C. Charcoal from level 8. Associated culture: Long Creek.

S-55 >30,000; before 28,050 B.C. Charcoal from 29 in. below level 8, in sterile zone.

Wettlaufer and Mayer-Oakes (1960: 137) note that the dates for S-49b and S-63b are suspect because of cataloguing errors.

Mortlach site

Besant valley, south-central Saskatchewan. Stratified, eight cultural horizons. Collected 1954 by B. Wettlaufer, Provincial Archaeologist. Sources: Wettlaufer 1955; Saskatchewan I: 34.

S-2: 3400±200; 1450 B.C. Bison bones from red ochre layer 7 ft below midden surface. Thunder Creek culture.

S-22: 1580±159; 370 A.D. Bison bone from 3 ft below midden surface. Besant culture.

S-28: 2400±173; 450 B.C. Humus with fragments of charcoal from 4 ft below midden surface. Sandy Creek culture.

Oxbow site

On lowest terrace of Souris River valley near Oxbow Dam (lat. 49° 13′ N, long. 102° 10′ W). Collected 1956 and submitted by R. W. Nero, Saskatchewan Mus. Natural Hist. Sources: Nero and McCorquodale 1958; Saskatchewan II: 80.

S-44: 5200±130; 3250 B.C. Charcoal from ashes of large hearth in buried soil, overlain by 9.5 ft of silt and soil. Artifacts found in association. Nero comments that this is at present the oldest date for a culture-bearing deposit in Saskatchewan and one of the oldest in the northern plains.

D. MANITOBA

Long Point site (HgLo-1)

Southern Indian Lake (lat. 57° 06′ N, long. 98° 29′ W). Non-ceramic site with stratified sections resulting from storm beach action. Very little recovered in terms of significant artifacts. Collected 1966 by J. V. Wright, Nat. Mus. Canada. Sources: Wright, in press; Nat. Mus. Canada file.

GaK-1261 (NMC-175): 930±80; A.D. 1020. Charcoal from test trench 2, first stratum capped by 6 to 8 in. sterile sand and gravel. Will determine whether site is non-ceramic or pre-ceramic and will test suggestion that occupation of Southern Indian Lake began about A.D. 1000.

GaK-1262 (NMC-176): 1000±80; A.D. 950. Charcoal from test trench 2, second duff line at depth of 30 to 34 in. Will determine whether significant gaps exist between stratified deposits.

Wright comments that during excavation, the site produced evidence that it was a non-pottery site rather than an early pre-pottery site. The two dates, which confirm stratigraphy, parallel dates from the stratified, pottery-producing Neck site (*see* below) and therefore support proposal that the site is non-pottery rather than pre-pottery.

MacBride site (HeLw-1)

Near embouchure of MacBride River into Barrington River west of Opachuwana Lake (lat. 56° 46′ N, long. 99° 47′ W). European trade items in direct association with Selkirk ceramics, stone and bone tools. Estimated age A.D. 1750. Collected 1966 by J. V. Wright, Nat. Mus. Canada. Sources: Wright, in press; Nat. Mus. Canada file.

GaK-1255 (NMC-177): <150; after A.D. 1800. Charcoal from test trench 1, northwest corner, below and among refuse at depth of from 2 to 5 in.

GaK-1267 (NMC-178): 360±100; A.D. 1590. Charcoal from test trench 2, depth 2 to 4 in.

Wright finds the date of GaK-1255 too late to pertain to the sample in question. The second date is acceptable inasmuch as it indicates the lateness of the deposits and therefore reinforces apparent association of European and aboriginal artifacts.

Neck site (HfLq-1)

Southern Indian Lake (lat. 56° 57′ N, long. 98° 44′ W). Two-component stratified Selkirk Focus site. Collected 1965 and 1966 by J. V. Wright, Nat. Mus. Canada. Sources: Wright, in press; Nat. Mus. Canada file.

I-2078 (NMC-70): 435±110; A.D. 1515. Charcoal from trench 2, stratum I (later occupation) southwest portion at depth of 10 in.

I-2080 (NMC-72): <A.D. 1210. Charcoal from trench 2, stratum II (earlier occupation) at depth of 14 in.

I-2081 (NMC-73): 730±150; A.D. 1220. Charcoal from trench 1, stratum II, northeast quadrant, depth 9 to 11 in.

I-2082 (NMC-74): 705±320; A.D. 1245. Charcoal from trench 2, stratum II, thin lens diverging from bottom of stratum II at south end of unit, depth 34 in.

GaK-1259 (NMC-173); 760±80; A.D. 1190. Charcoal from Square A, stratum I, depth 13 in. directly under flooring of potsherds. Estimated age 16th century.

GaK-1260 (NMC-174): 1190±70; A.D. 760. Charcoal from test trench 3, stratum II, depth approximately 7 to 9 in. Estimated age 13th century.

Wright points out that each of the two sets of dates agrees with the stratigraphic sequence. The I-2082 determination, which agrees with I-2080 and I-2081, indicates that the thin lens is not significantly earlier than the rest of stratum II. However, the Gakushuin dates are consistently earlier than those from Isotopes. On the basis of what is known of Selkirk Focus time depths, Wright tends to favour Isotopes readings.

III. EASTERN CANADA

A. ONTARIO

Armstrong mound

See Long Sault site, below.

Bennett site (AiGx-1)

Nelson Twp., Halton Co. (lat. 43° 25′ N, long. 79° 57′ W). Large palisaded site of late Pickering branch of Ontario Iroquois tradition, occupied just prior to Uren site. Collected 1962 by J. V. Wright, Nat. Mus. Canada. Sources: Wright 1966*a*; GSC III: 180; Michigan X: 139.

GSC-143: 690±130; A.D. 1260. Charcoal from pot concentration 3 under pottery fragments and 4 to 9 in. below plough zone.

M-1527 (NMC-15): 670±100; A.D. 1280. Charcoal from pit 41 at depth of 40 in., directly under burial B. Should act as check on date of GSC-143 and allow more accurate estimate of this critical period in development of Ontario Iroquois tradition. Estimated age A.D. 1250.

Wright comments that the close correlation of dates with each other and with the seriational estimate supports a temporal placement of the site and also supports the accuracy of seriational estimates in Ontario Iroquois archaeology.

Beswetherick site (BcGw-1)

Vespra Twp., Simcoe Co. (lat. 44° 23′ N, long. 79° 43′ W). Site is the only presently known component falling between Uren and Middleport substages of Ontario Iroquois tradition. Collected 1963 by R. E. Channen, Simcoe County Museum. Source: Michigan X: 139.

M-1526 (NMC-14): 590±100; A.D. 1360. Charcoal from bottom of large pit at depth of 15 in. Estimated age A.D. 1350.

Channen comments that date substantiates method of age estimation by ceramic seriation in Iroquois studies.

Burley site

Former mouth of Ausable River, *ca.* 1 mi from Lake Huron. Profile (from bottom to top): (a) sand below 12-ft level above lake; (b) occupation horizon no. 1 in dark sand, 12- to 14-ft level; (c) stratified alluvial sand with freshwater snail shell, 15- to 17-ft level; (d) 2nd occupation level ½ to 1 ft thick; (e) light gray sand ½ to 1 ft thick; (f) 3rd occupation level, dark sand; (g) top cover of windblown sand, 1 to 2 ft thick, 18 to 20 ft above present lake level. Collected 1950 by W. Jury, University of Western Ontario. Sources: Jury and Jury 1952; Chicago III: 674.

C-608: 2619 ± 220; 669 B.C. Charcoal from occupation horizon no. 1. It is believed that this may date from the early one-outlet stage of the Nipissing Great Lakes.

Donaldson site (BdHi-1)

Saugeen River near Southampton, Bruce Co. (lat. 44° 30′ N, long. 81° 22′ W). Cultural material is unstratified, early Middle Woodland period. Collected 1960 by J. V. Wright, Nat. Mus. Canada. Sources: Wright and Anderson 1963; Saskatchewan III: 77.

S-119: 2480±60; 530 B.C. Charcoal from refuse pit at depth of 16 to 36 in. and overlain by 14 in. of plough zone.

Frank Bay site

Lake Nipissing. Stratified, with eight cultural levels. Collected (date not given) by F. Ridley, Toronto, Ontario. Sources: Ridley 1954; Michigan I: 669.

M-363: 2920±300; 970 B.C. Charcoal from just above highwater erosion mark on Lake Nipissing shore. Should date pre-ceramic Mattawan complex.

Haines Lake site

Haines Lake (lat. 45° 21′ N, long. 79° 56′ W). Apparent dugout canoe 17.5 ft long with 2-ft beam and about 18 in. high. Stern embedded in mud. Collected 1957 by N. Ritchie and E. Galt for J. N. Emerson, University of Toronto. Source: Saskatchewan II: 79.

S-43: 400±120; A.D. 1550. Wood from canoe, depth 8 to 10 ft.

Emerson notes that contrary to original speculations, the object is comparatively recent.

Heron Bay site (DdIn-1)

Thunder Bay district (lat. 48° 37′ N, long. 86° 17′ W). Early Middle Woodland Laurel component. Seriation of Laurel tradition material in northern Ontario indicates Heron Bay site is one of earliest components. It is also the component from which largest sample and greatest amount of data were recovered. It is vital to consolidate temporal span of this tradition, which played a major role in forming character of Middle Woodland assemblages of northeast. Dates for S-119 (Donaldson site, above) and M-1507 (Sand River site, below) suggest temporal span of at least 1,000 years for Laurel tradition in Ontario. Collected 1960–1964, 1966 by J. Wright, Nat. Mus. Canada. Sources: Wright 1967; Nat. Mus. Canada file.

GSC-445 (NMC-57): 1540±160; A.D. 410. Charcoal from soot-stained lens in excavation unit T, southwest sector, at depth of 10 to 12 in.

GSC-449 (NMC-58): organic fraction 1160±130; A.D. 790. Inorganic fraction 390±130; A.D. 1560. Charred bone from major cultural stratum which is capped with sterile lens of sand.

GSC-686 (NMC-93): 1810±150; A.D. 140. Encrusted carbon from potsherds.

Wright finds all three dates too late, although the one for GSC-686 comes closer than the others to the estimated date of 500 to 200 B.C. The two dates not recorded in the Nat. Mus. Canada file, GSC-208 and S-171, are also too late, falling between 5th and 8th century. Estimate was based upon seriation and radiocarbon data.

Hungry Hall site

Hungry Hall Reserve (lat. 48° 49′ N, long. 94° 42′ W). Collected 1959 by W. A. Kenyon, Royal Ontario Mus. Sources: Kenyon 1960*a*; Saskatchewan III: 77.

S-109: 760±60; A.D. 1190. Charred log from burial mound 2, from log covering of burial chamber below low mound. Charring probably resulted from fire in connection with burial ceremony, after construction of tomb but before erection of mound. Kenyon notes that this is first date on the Rainy River mounds, probably work of some prehistoric Siouan-speaking group.

Inverhuron site

Mouth of Little Sauble River (lat. 44° 17′ 40″ N, long. 81° 35′ 40″ W). No stratification. Collected 1957 by W. A. Kenyon, Royal Ontario Mus. Source: Saskatchewan II: 79.

S-60: 2850±60; 900 B.C. Charcoal from Archaic component, from hearth or cooking pit at depth of 2 ft.

Kenyon notes that this date can be compared with M-363 for the Mattawan stratum, another late Archaic culture of the Frank Bay site (*see* above).

Killarney Bay site

Killarney Bay, Manitoulin district (lat. 45° 59′ N, long. 81° 30′ W). Beach is at elevation of 27.3 ft above Lake Huron. Site apparently runs from Early Woodland into Hopewellian times. Collected 1952 and 1953 by E. F. Greenman, University of Michigan. Sources: Greenman 1966; Michigan I: 668; Michigan IV: 183; Michigan XI: 274.

M-194: 2180±300; 230 B.C. Charcoal from narrow streak of black sand and charcoal apparently carried from bottom of hearth by wave action. Should date Point Peninsula in this area.

M-428: 2040±200; 90 B.C. Beaver fur wrapped around four copper celts with flattened narrow polls, a large copper four-sided awl or spindle, about 550 small copper beads, and fifteen shell beads. Materials were with burial no. 8.

M-1482: 1930±130; A.D. 20. Charcoal from trench 3 in apparent steam bath, 24 to 25 ft above Lake Huron's former 579.3 ft level. J. B. Griffin, University of Michigan, commented on this last date and found it satisfactory.

Lawson site

London Twp., Middlesex Co. (lat. 43° 04′ N, long. 81° 17′ W). Prehistoric Neutral division of Neutral–Erie branch of Ontario Iroquois tradition. Collected 1921 by W. J. Wintemberg, Nat. Mus. Canada. Source: Michigan X: 140.

M-1552 (NMC-38): 200±100; A.D. 1750. Carbonized corn and corn cob fragments from general digging, midden 13. Submitted by J. V. Wright, Nat. Mus. Canada, to date key site of Neutral division and act as check on seriational estimates. Estimated age A.D. 1500.

Wright comments that as site is prehistoric, it is obvious that sample gave too late a reading (for further discussion of this late date on corn *see* Hall 1967.

Long Sault site

Long Sault Indian Reserves nos. 12 and 13, Rainy River district (lat. 48° 38′ 48.4″ N, long. 94° 04′ 22.5″ W). Laurel culture, Middle Woodland. Collected 1966 by W. A. Kenyon, Royal Ontario Mus. Sources: Wright 1967: 89–93; Nat. Mus. Canada file.

I-2594 (NMC-118): 1010±100; A.D. 940. Charcoal from Armstrong mound 7, from charred log from immediately on top of old sod line on which mound was built. Since this log formed part of cribbing used in mound construction, sample is presumably contemporary with building of mound.

Kenyon finds date extremely puzzling since it was expected to be at least 600 years earlier. However, another date recently received from Middle Woodland burial mound in Trent River system agreed almost exactly with that of Armstrong mound. Since dates confirm each other, Middle Woodland may have persisted later than expected.

McCluskey site (DbJm-2)

Thunder Bay district (lat. 48° 14′ N, long. 90° 02′ W). Extensive Blackduck village site. Collected 1962 by K. C. A. Dawson, Lakehead University. Source: Nat. Mus. Canada file.

GaK-1282 (NMC-164): 1990±90; 40 B.C. Charcoal from square 0S110W, depth 10 in., immediately above pottery cache in what appears to be a roasting pit. Estimated age 1,000 years.

Dawson finds date approximately 1,000 years earlier than expected for a Blackduck site. Early date may be the result of Laurel material, evidenced by few Laurel sherds recovered, or be due to an underlying charcoal layer left by early forest fire.

McIvor site (BfFv-1)

Grenville Co. (lat. 44° 56′ N, long. 75° 32′ W). Prehistoric Onondaga village site bearing close relationship to Roebuck site. Will act as check on Roebuck site date (*see* below), run on carbonized corn kernels, which is apparently too early. Will also help evaluate relative accuracy of carbonized wood and carbonized foodstuffs from Iroquois sites in view of some very erratic readings obtained on latter. Collected 1964 by J. V. Wright, Nat. Mus. Canada. Source: Nat. Mus. Canada file.

GSC-441 (NMC-53): 320±130; A.D. 1630. Charcoal from Square A. in midden deposit.

GSC-457 (NMC-54): 140±130; A.D. 1810. Corn kernels and cob fragments from square A in midden deposit.

GSC-460 (NMC-55): 90±130; A.D. 1860. Corn kernels from square B in midden deposit.

GSC-442 (NMC-56): 280±130; A.D. 1670. Charcoal from square B in midden deposit.

Wright notes that the charcoal dates are approximately 100 years too late. That carbonized corn material consistently dated later than the associated charcoal samples suggests that there is an unknown factor which relegates dates of corn to a very hazardous position (*see* Hall 1967).

Malcolm site

Three miles west of Cornwall, Stormont Co. (lat. 45° 01′ N, long. 74° 49′ W). Site mantled by Point Peninsula 4 material, with pits devoid of cultural material below. Collected 1954 by J. V. Wright, Nat. Mus. Canada. Sources: Dailey and Wright 1955; GSC II: 54–5.

GSC-86: 3850±90; 1900 B.C. Charcoal from pit 11, trench 1, sector 15, depth 22 to 25 in. below surface.

Wright comments that the date indicates that the pits are much older than Point Peninsula 4 and suggests that they belong to the Archaic period, even though diagnostic Archaic traits are lacking.

Miller site

Pickering Twp. (lat. 43° 52′ N, long. 79° 05′ W). Glen Meyer aspect (reclassified as Pickering Branch, Ontario Iroquois tradition: *see* Wright 1966*a*: 24). Collected 1959 by W. A. Kenyon, Royal Ontario Mus. Sources: Kenyon 1960; Saskatchewan III: 77.

S-108: 835±70; A.D. 1115. Charcoal from fill in shallow pit at depth of 20 in., overlain successively by thin lens of clear sand and another pit fill.

Kenyon notes that this is the first C-14 date for this complex.

Pic River site (DdIn-2)

West bank of mouth of Pic River, north shore of Lake Superior (lat. 48° 36′ N, long. 86° 17′ W). Pure component of Blackduck Focus, which played major role in the Late Woodland culture history of north Minnesota, northwest Ontario, and southeast Manitoba. Collected 1960 by J. N. Emerson, University of Toronto. Sources: Wright 1965, 1966; GSC II: 54.

GSC-85: 1000±80; A.D. 950. Charcoal from stratum 3, square OEIN2, depth 9 in.

Roebuck site (BeFv-4)

Grenville Co. (lat. 44° 49′ N, long 75° 36′ W). Large palisaded Iroquois village excavated by Wintemberg in 1912 and 1915, classified by him as late prehistoric proto-Mohawk–Onondaga. MacNeish assesses it as late prehistoric Onondaga–Oneida, on basis of ceramics. Both recognize similarity with Hochelaga. Collected 1963 by J. F. Pendergast and R. H. Grasely. Sources: Wintemberg 1936; MacNeish 1952; Michigan X: 139–40.

M-1538 (NMC-26): 560±100; A.D. 1390. Vegetal charcoal, primarily wood, but including some corn, beans, and cherry and plum pits from three widely separated areas on site, all from undisturbed deposits, ash and midden, depths 8 to 24 in. Estimated age A.D. 1500.

Pendergast comments that date range established, 1290 to 1490, introduces a new factor in Ontario Iroquois archaeology. Should 14th century date be correct, other sites in the area, which are judged to be earlier on the basis of ceramics, would be put back into mid or late 13th-century period, on the same time level as the Bennett site (*see* above). It would then have to be said that eastern Ontario Iroquois ceramics were infinitely superior in sophistication of shape, motif, and technique to other Ontario Iroquois at that time. Since this seems unlikely, the 14th century date is probably incorrect. Close mutual relationship observed between Roebuck and Hochelaga, visited by Cartier in 1534, favours, instead, date in second half of 15th century (*see* Hall 1967).

Salem site (BgFp-4)

Glengarry Co. (lat. 45° 04′ N, long. 74° 35′ W). Large prehistoric Iroquois site, closely related to, but apparently older than, Roebuck site on basis of ceramic seriation. Available evidence suggests Onondaga ceramics and pipes obtained high level of sophistication significantly earlier than Ontario Iroquois tradition to the west. Estimated age A.D. 1400. Collected 1963 and 1964 by J. F. Pendergast and G. Gogo. Sources: Pendergast 1964, 1966; Michigan X: 140; Nat. Mus. Canada file.

M-1541 (NMC-28): 60±100; A.D. 1890. Vegetal charcoal, primarily corn, but including beans and cherry pits from undisturbed midden of black soil from depth of between 8 and 24 in.

GSC-446 (NMC-59): 410±130; A.D. 1540. Charcoal from pit at depth of 5 to 6 in.

GSC-458 (NMC-60): 390±130; A.D. 1560. Charcoal from pit located 10 ft west of pit yielding GSC-446, from white ash at depth of 14 to 22 in.

The Michigan date, according to Pendergast, is much too late. The remaining two are later than Roebuck (*see* above) and Hochelaga (*see* Dawson site, Quebec, below), yet on the basis of ceramic seriation, Salem should precede both these sites. Like the late dates for earlier Berry site (*see* below, Quebec), GSC dates for Salem appear to be about 100 years too late. There appears to be yet no stability of C-14 dates for the Salem site; therefore until more credible dates are available, it is suggested, on the basis of ceramic seriation, that Salem be considered an earlier site than Roebuck and a later site than Berry (*see* Hall 1967).

Sand River site (CiIe-1)

West bank of Sand River at its mouth, Lake Superior (lat. 47° 26′ N, long. 84° 44′ W). Single small component of Laurel tradition. Analysis of Donaldson site (*see* above), with approximate date of 500 B.C., revealed presence of small sample of Laurel tradition ceramics and suggests Laurel much earlier than previously believed. Extension of time depth of this western complex has critical bearing on problem of Middle Woodland origins. Date in excess of 500 B.C. would greatly clarify its relationship to eastern Middle and Early Woodland complexes. Estimated age 500 to 800 B.C. Collected 1963 by J. V. Wright, Nat. Mus. Canada. Sources: Wright 1967: 68–70; Michigan X: 130–1.

M-1507 (NMC-5): 1630±100; A.D. 320. Charcoal from undisturbed hearth (feature 1) with associated ceramics and stone artifacts in a band

1 to 3 in. thick, 5 in. below exposed surface (original depth of overburden unknown; site exposed by highway construction).

Wright points out that, at the time of the age estimates, analysis of Laurel components in northern Ontario was incomplete. New completed seriations indicate that Cile-1 site is late, and in light of new data, later date is acceptable. Other C-14 dates on Laurel and related Middle Woodland complexes suggest that an extensive time range is involved in Laurel tradition and that change was very gradual.

Serpent Mounds site (BbGm-2)

Peterborough Co. (lat. 44° 12′ 24″ N, long. given in Michigan IV as 78° 05′ 14″ W, in Michigan VIII as 78° 09′ 14″ W). Ceramic material from this site suggests placement in Point Peninsula 2. Collected 1956 and 1959 by R. B. Johnston, Royal Ontario Mus. (now Smithsonian Inst., River Basin Surveys). Sources: Johnston 1958, 1958*a*, 1959, 1960; Michigan IV: 183; Michigan VIII: 242.

M-850: 1830±200; A.D. 120. Carbonized remains of two small logs found in direct association with partially cremated burial no. 4 near the eastern end of Serpent Mounds. This primary inclusive partial cremation was lying in a flexed position on right side in fill 2.1 ft below mound surface. Charcoal, found beside the vault of the skull, is most easily interpreted as the remains of logs used in cremation. The date from the sample would therefore date burial and supply minimum date for portions of mound below burial.

M-1104; 2020±75; 70 B.C. Charcoal from square 60-S-2 of shell midden, found 20 in. below surface, was resting on yellow sandy loam which was the sterile foundation throughout the midden. Overlying charcoal was 3 in. of shell-flecked dark brown loam, a 12-in. shell layer, and a 5-in. sod zone. Provenience of sample suggests it would date construction of midden at this point, or perhaps better indicate time of earliest shell accumulation. Charcoal was derived from what seems to be old ground surface upon which shell layer rests. Midden has produced a considerable ceramic sample, of which the earliest is of Vinette II character. Few Late Woodland (chiefly Glen Meyer) types have been recovered (material reclassified as Pickering Branch—*see* Wright 1966*a*: 24). This sample is the only direct means of establishing a chronological reference for the midden. Date will also aid in defining relationship of midden to Serpent Mounds.

M-1105: 1660±75; A.D. 290. Charcoal from extensive concentration of pure charcoal which extended through two 5-ft squares (C12d 10-1 and C12c 10-10) near southern extent of mound. Charcoal mass was evidently remains of several logs or portion of tree buried in mound fill, an average of 2 ft below surface, and *ca.* 1.5 ft above buried old-sod layer. Should date construction of mound, at least that portion from which it was recovered.

Johnston comments that the date (M-1104) on the shell midden corroborates the placement of lower midden levels on internal and comparative seriational evidence. The other two dates, from different sections of mound fill, could be regarded as contemporary if they are adjusted to within the indicated ranges of probable error. However, he would be inclined to accept the results at face value, as suggested by indirect internal evidence, indicating the difference of 174 years between the two samples which were separated in the mound by *ca.* 111 ft. Dates would place construction of mound in later portion of Adena and middle range of Hopewell as it is understood from C-14 dates in Ohio Valley.

Stafford site

Elgin Co. (lat. 42° 43′ N, long. 80° 47′ W). Glen Meyer Branch of Ontario Iroquois tradition. Collected 1951 by T. E. Lee, submitted by J. V. Wright, Nat. Mus. Canada. Source: Michigan X: 141.

M-1553 (NMC-39): 490±100; A.D. 1460. Carbonized corn and corn cobs from test trench 4, extension F, depth 12 to 18 in. Estimated age A.D. 1100 to 1200.

Wright finds the date too late and regards seriational estimate as approximately correct. Smallness of sample size may have been a factor in late date (*see* Hall 1967).

Sturdy Bay site (DeIo-1)

Lake Superior approximately 4 mi northwest of Marathon (lat. 48° 47′ N, long. 86° 26′ W). Site represented by thin surface debris and occasional hearths occurring along five elevated beaches. Collected 1960 by J. V. Wright, Nat. Mus. Canada. Source: Michigan X: 139.

M-1537 (NMC-25): 3390±140; 1440 B.C. Charcoal from hearth 1 at altitude 40 ft above lake level, from basal portion of hearth at approximate depth of 6 in. Estimated age in excess of 2000 B.C.

Wright notes that as there are virtually no C-14 estimates for Shield Archaic in northern Ontario, the date assists in placing in time one of the components of this widespread and little known assemblage. It is of more direct value for estimating the age of related sites in the same general area at the 40-ft beach elevation.

Summerstown Station site (BgFp-1)

Glengarry Co. (lat. 45° 05′ N, long. 74° 35′ W). Large Iroquois village site noted by Wintemberg but not excavated until recently. Collected 1963 by G. N. Gogo, submitted by J. F. Pendergast, Ottawa. Sources: Wintemberg 1936; Michigan X: 140.

M-1539 (NMC-27): 100±100; A.D. 1850. Carbonized corn kernels and cob from different areas of site from black midden soil at depth of 8 to 10 in. below plough line.

Pendergast finds the date range unacceptable. The site was probably occupied some time between Roebuck (*see* above) and Salem (*see* above) (*see* Hall 1967).

Site CaGi-1

Near Deep River (lat. 46° 06′ N, long. 77° 27′ W). Site is Point Peninsula, but relatively early Iroquoian component is also represented. Collected 1962 by B. M. Mitchell, Deep River. Sources: Mitchell 1966; Nat. Mus. Canada file.

I-2083 (NMC-75): 1820±100; A.D. 130. Charcoal from depth of 12 to 16 in., found in 40-in. deep refuse pit in square D-19W. Containing Vinette I potsherds, firestone, flint chips, ash, and carbonized wood.

I-2084 (NMC-76): 2030±100; 80 B.C. Charcoal from depth of 24 in., in same pit.

Mitchell suggests that if two standard deviations are used rather than one, the ranges of dates overlap by 190 years to provide an average age of 1,925 years or A.D. 25, which agrees well with the age estimate of 1,900 years and supports the chronological priority of the Early Point Peninsula Vinette I ware in Canada.

B. QUEBEC

Allumette Island-1 site

Circa 400 ft north of Lower Allumette (Westmouth) Lake, Pontiac Co., *ca.* 3 mi down Ottawa River from Pembroke, Ontario (lat. 45° 49′ N, long. 77° 01′ W). Site yielded 1,012 copper artifacts, many distinctive of Old Copper culture. Estimated age 3,000 to 5,600 years, based on dates from Riverside Cemetery, Michigan (M-658, Michigan III) and Oconto, Wisconsin (C-836, Chicago V). Collected 1963 by C. C. Kennedy. Source: Michigan X: 141.

M-1548 (NMC-34): 3060±150; 1110 B.C. Charcoal from pit, apparently hearth, depth 7 to 13 in., latter being maximum depth of pit.

M-1549 (NMC-35): 1100±100; A.D. 850. Charcoal from burial pit fill, around bones of skeleton and from beneath them. Uppermost bones disturbed by ploughing to depth of 6 to 7 in., but charcoal apparently in situ.

J. B. Griffin, University of Michigan, comments that date for M-1549 is much too young for Old Copper association. Additional samples are needed to date more accurately late Archaic complex at site.

Berry site (BgFo-3)

Huntingdon Co. (lat. 45° 05′ N, long. 74° 37′ W). On basis of ceramic seriation this is earliest recognized component in Onondaga sequence in area, and samples should provide base date. Collected 1964 by J. F. Pendergast and L. H. Wylie. Sources: Pendergast 1967; Nat. Mus. Canada file.

GSC-453 (NMC-61): 450±130; A.D. 1500. Charcoal from pit 1 at depth of 18 to 24 in.

GSC-451 (NMC-62): 500±130; A.D. 1450. Charcoal from pit 2 at depth of 18 to 24 in.

Pendergast comments that if the Berry site is in fact an early component of local Iroquois sequence, the earlier date leaves less than 100 years for the whole of this sequence to evolve before Cartier's visit to Hochelaga in 1534. Though not impossible, this appears to be unlikely in view of the numerous kindred sites in the area which involve significant artifact variation of a nature unlikely to occur in less than 100 years. If, on the other hand, the date is correct, or nearly correct, both dates provide grounds on which to postulate a coeval non-Iroquois people who were making crude reproductions of Iroquois pottery and were using a linear-stamping technique instead of incising. Bearing in mind the gross discrepancies in C-14 dates available to date for this area, e.g., Summerstown Station (*see* above, Ontario) and Salem (*see* above, Ontario), to say nothing of any lesser strains on credibility, e.g., Roebuck (*see* above, Ontario), it is suggested, on the basis of ceramic seriation, that Berry be considered an earlier site than Salem and the earliest village site located to date in the area.

Blanc Sablon-1 site

West bank Blanc Sablon River *ca.* 1 mi west of Labrador border. Boreal Archaic site. Collected 1961 by E. Harp, Jr., Dartmouth College Mus. Source: Pennsylvania IX: 361.

P-690: 2013±49; 63 B.C. Charcoal and sand from horizon containing flint chips, buried 9 in. below surface, *ca.* 80 ft south of road and 0.25 mi west of Blanc Sablon River.

P-684: 1068±45; A.D. 882. Charcoal, peat, and soil from horizon containing flint chips buried 21 in. below surface, *ca.* 250 ft south of road on west bank of Blanc Sablon River.

Blanc Sablon-4 site

Circa 600 ft west of Blanc Sablon River and *ca.* 0.25 mi north of road, 1 mi west of Labrador border. Boreal Archaic site. Collected 1961 by E. Harp, Jr., Dartmouth College Mus. Source: Pennsylvania IX: 361.

P-686: 1223±45; A.D. 727. Sandy peat from soil horizon containing Boreal Archaic implements and flint chips, buried 18 in. below surface.

Davidson site (CkEe-2)

Lake Temiscouata (lat. 47° 40′ 15″ N, long. 68° 47′ 50″ W). Stratified site with Archaic to Middle Woodland occupation. Collected 1965 and 1966 by R. Wilson and C. A. Martijn, University of Wisconsin. Source: Nat. Mus. Canada file.

GaK-1270 (NMC-141): 1970±100; 20 B.C. Charcoal from area A, square 7, level 3, at depth of 10 in. below surface. Associated with Late Archaic assemblage, probably older than 1000 B.C.

GaK-1268 (NMC-142): 220±70; A.D. 1730. Charcoal from area A, square 17, level 2, at depth of 6 in. below surface, associated with rock hearth (feature 1). Middle Woodland, estimated age between A.D. 500 and 900.

Martijn regards the GaK-1268 date as much too late, with probable contamination from roots, which infested the area. Date for GaK-1270 is later than expected, but there are no compelling reasons for rejecting it. More samples from this site, particularly from area B, should be run for comparative purposes.

Dawson site

Montreal (lat. 45° 30′ N, long. 73° 35′ W). Prehistoric Iroquoian component which, being only Iroquoian site in city of Montreal, is at present the most likely candidate for site of Hochelaga, visited by Jacques Cartier in 1534. Collected 1965 by J. F. Pendergast Source: Nat. Mus. Canada file.

GSC-687 (NMC-95): 470±160; A.D. 1480. Encrusted carbon from interior of potsherds.

Pendergast comments that while the date would appear to add greater credence to the proposal that the Dawson site is in fact that of Cartier's Hochelaga, later conclusions, reached from a study of the total artifact assemblage, remain valid and stand as a caution against making the Dawson site and Hochelaga synonymous. Assuming that Cartier's Hochelaga was an Iroquoian village, the Dawson site may be: (1) Cartier's Hochelaga; (2) a site which predates Hochelaga, with the small sample of European material representing the trickle of trade goods into the area from Tadoussac before Cartier arrived; (3) a site which post-dates Cartier's visit, being a relocated village of the Hochelagans; (4) a site which post-dates Cartier's visit, being that of a group unknown to Cartier; or (5) a site coeval with Hochelaga but unknown to Cartier. In any event, the Dawson site is the latest known Iroquoian site in the St. Lawrence River valley and hence probably very closely represents the material culture of Cartier's Hochelagans.

Deception Bay stone dwelling

Ungava Peninsula (lat. 62° 30′ N, *ca.* long. 76° W). Beehive-shaped stone dwelling in habitation site on hill at head of bay. Large site, with only such dwelling known in Ungava. Several lines of evidence suggest site not Eskimo; it was thought perhaps attributable to pre-Thule period. Overlying lichens and moss suggest antiquity of at least a century. Collected 1965 by T. E. Lee, Laval University. Sources: Lee 1967; La Jolla V: 292.

LJ-1355+1359; contemporary. Adequate supply of mammal bones of several species, from *ca.* 0.6 to 0.7 m beneath upper surface of two-layered stone paving of collapsed beehive-shaped structure. Lee, describing preparation of this sample, comments on unreliability of carbonate fraction of bone; collagen sample has not been run.

McInnes site (CkEe-5)

Grand Touladi Lake (lat. 47° 43′ 21″ N, long. 68° 46′ 28″ W). Late Middle Woodland and possibly early Late Woodland, associated with projectile points of Jack's Reef corner-notched type. Estimated age between A.D. 700 and 900. Collected 1966 by E. Howe and C. A. Martijn, University of Wisconsin. Source: Nat. Mus. Canada file.

GaK-1276 (NMC-147): 6500±180; 4550 B.C. Charcoal from square 3, level 2b, depth 1 ft 6 in., at bottom of pit containing bone fragments, cracked rock, chips, and fragmentary projectile point.

GaK-1277 (NMC-148): 1400±90; A.D. 550. Charcoal from square 8, level 2c, from among fire-cracked rocks of large hearth (feature 1), depth 7 in.

Martijn notes it was anticipated that GaK-1276 would be the younger of the two samples, since the pit from which the sample was obtained appears to have been dug from a higher level. The surprisingly old date of this sample is a puzzling problem. Unfortunately, cultural material in direct association with it does not provide any clues with regard to its chronology. On the basis of cultural material from the rest of the site, the date seems much too old. Although the pit extended only 1½ ft from the surface, the possibility cannot be ruled out that its stratigraphy may have been more complex than was originally thought, e.g., one pit superimposed on another with the lower one being of a considerably earlier date. Although GaK-1277 was earlier than originally estimated, the date seems acceptable on the basis of cultural material found. It is to be hoped that more samples from this site will be tested to determine whether or not they are in agreement.

Michea site

North side Payne River, 0.4 km below outlet of Payne Lake (*ca.* lat. 59° 17′ N, long. 73° 20′ W). Collected 1964 by T. E. Lee, Laval University. Source: La Jolla V: 291–2.

LJ-1351: 800±100; A.D. 1150. Slightly charred decayed stem of dwarf arctic birch from house pit 10, trench 3, level 14; 4 m above river level. Definitely from oldest house floor (deposits clearly stratified, resting on clean yellow sand), at depth of 48 cm, overlying vegetation lichens and mosses only.

Lee comments that since 1948, site has been erroneously ascribed to Dorset culture. Field-work in 1964 indicated that the pits were not dug by people of that culture. Stone work is identical with historic Sadlermiut culture (Eskimo). Origins of these cultures are poorly known. First-known inland occurrence of either Dorset or Sadlermiut culture.

Morrison's Island-6 site

Pontiac Co., about 3 mi down Ottawa River from Pembroke, Ontario (lat. 45° 48.5′ N, long. 77° 02′ W). Brewerton Focus (Laurentian Archaic) lithic complex, with abundance of native copper artifacts. Collected 1963 by C. C. Kennedy. Sources: Kennedy 1967; GSC III: 180.

GSC-162: 4700±150; 2750 B.C. Charcoal from squares T14X and T14Y at burial 17 at altitude 426 ft. Maximum depth of burial 28 in.

J. V. Wright, Nat. Mus. Canada, finds the date slightly older than expected, but not unreasonable.

Tuktu site (*see* Michea site above)

North side of Payne River about a quarter mile east of its debouchure from Payne Lake in the Ungava interior (approximate lat. 59° 17′ N, long. 73° 20′ W). Collected August 19, 1957 by W. E. Taylor, Jr., Nat. Mus. Canada. Sources: Taylor 1958, 1959, 1962, 1964*b,* 1964*c,* 1966, in press *a.*

P-176: 649±100; A.D. 1301. Raw antler from northeast corner of square 1, test pit 3, at a depth of 13 to 17 in., in a Dorset culture stratum of near-black, greasy, peaty humus. This culture stratum lay on a coarse sand and gravel mix of pale subsoil containing root strands. Above the Dorset culture layer was a seemingly sterile sand stratum overlaid by modern turf.

P-177: 709±94; A.D. 1241. Raw caribou skull (bone) from the same small concentration of caribou bone that gave sample P-176 and in exactly the same context. Sample P-176 is of antler removed from the skull (P-177) in the laboratory.

Taylor identifies the Tuktu site of his 1957 work as T. E. Lee's Michea site of 1964 (*see* above). Although skeptical (Taylor 1964*b*) of the 1948 data that led to the initial suggestion that this site was Dorset, as is Lee (above), Taylor (1958, *et seq.*), as a result of his 1957 field-work there, reported the site to contain both Dorset culture and post-European contact remains. Despite Lee's more recent conclusions, Taylor retains his original interpretation. Further, he rejects Lee's claim that stone work of this site is identical to that of historic Sadlermiut in so far as he understands it from the literature and from field-work on Southampton, Coats, and Walrus islands (Taylor 1960). A single fragmentary Dorset harpoon head is one of the very few age indicators in Taylor's Tuktu sample. Since it suggests a middle to late Dorset period occupation and since P-176 and P-177 indicate an occupation late in the Dorset continuum, Taylor considers these two test results approximately correct, as indicated earlier (1964*b*), although because of their material, they may be a little too young. (*Editor's note:* samples P-176 and P-177, which have been published by Taylor, were dated by the University of Pennsylvania laboratory in 1958 but were not published in *Radiocarbon.*)

C. NOVA SCOTIA

Bear River site

Bear River (lat. 44° 37′ 30″ N, long. 65° 42′ W). Upper 10 in. contained projectile points of silicious slate, usually corner-notched. Below 10 in., points were stemmed or side-notched and were usually of quartzite, a type associated in Maine with a Late Boreal Archaic horizon but here with Woodland pottery. Collected 1959 by J. S. Erskine. Sources: Erskine 1960, 1962; Saskatchewan IV: 234.

S-158: 2125±65; 175 B.C. Charcoal from hearth at wigwam shelf levelled out of glacial terrace, at depth of 15 in., in upper third of lower ('lower Bear River') level.

Erskine believes that since much Woodland pottery is found below 15 in. at Bear River, this culture in Nova Scotia must have begun earlier than 175 B.C.

Debert site (BiCu-1)

Circa 10 mi west of Truro (lat. 45° 25′ N, long. 63° 26′ W). Palaeo-Indian occupation site. Collected 1963–1964 under direction of D. S. Byers, R. S. Peabody Foundation, and George F. MacDonald, Nat. Mus. Canada. Sources: Borns 1965; Byers 1966; MacDonald 1966, 1967; Stuckenrath 1964, 1966; Pennsylvania IX: 355–8.

P-744: 5019±70; 3069 B.C. Charcoal from charred root or resin cinder, not associated with artifacts.

P-740: 7671±92; 5721 B.C. Charcoal from hearth in feature 3, associated with Palaeo-Indian artifacts. Date is nearly 3,000 years younger than all other archaeological samples from site and is presumed to include modern materials.

P-743: 10,452±128; 8502 B.C. Charcoal from hearth in feature 4, associated with Palaeo-Indian artifacts.

P-739: 10,642±134; 8692 B.C. Charcoal from pit A in feature 7, associated with Palaeo-Indian artifacts.

P-741: 10,531±126; 8581 B.C. Charcoal from pits A, B, C, and D in feature 7, associated with Palaeo-Indian artifacts.

P-966: 10,557±121; 8607 B.C. Charcoal from hearth in feature 7, associated with Palaeo-Indian artifacts.

P-967: 10,626±244; 8676 B.C. Charcoal from hearth in feature 7, associated with Palaeo-Indian artifacts.

P-970: 10,477±90; 8527 B.C. Charcoal from feature 11, hearth no. 1, associated with Palaeo-Indian artifacts.

P-971: 10,758±226; 8808 B.C. Charcoal from feature 11, hearth no. 2, associated with Palaeo-Indian artifacts.

P-972: 10,496±120; 8546 B.C. Charcoal from hearth in feature 12, associated with Palaeo-Indian artifacts.

P-973: 10,637±114; 8687 B.C. Charcoal from hearth in feature 15, associated with Palaeo-Indian material.

P-974: 10,824±119; 8874 B.C. Charcoal from hearth in feature 16, associated with Palaeo-Indian artifacts.

P-975: 11,011±225; 9061 B.C. Charcoal from hearth in feature 17, associated with Palaeo-Indian artifacts.

P-977: 10,113±275; 8163 B.C. Charcoal from hearth in feature 19, associated with Palaeo-Indian artifacts.

P-978: 5790±132; 3840 B.C. Charred root, not associated with artifacts, from section G.

Port Mouton site (AlDf-1)

Port Mouton Harbour, Queens Co. (lat. 43° 55′ 42″ N, long. 64° 50′ 05″ W). Stratified site, with late Upper Bear River culture stratigraphically below thinner Indian Gardens deposit. Collected 1966 by J. S. Erskine and C. Therian, Wolfville, Nova Scotia. Source: Nat. Mus. Canada file.

GaK-1271 (NMC-155): 2640±70; 690 B.C. Charcoal from near bottom of site, depth 26 in., late Upper Bear River level.

Erskine comments that date conflicts seriously with earlier determination of A.D. 648 to 840 for upper Bear River culture at Port Joli (S-155, unpublished) and date of 265 to 96 B.C. for period just preceding Upper Bear River at Bear River subsite 3 (S-159, unpublished). There seems no possibility of contamination of the present sample. More stratified sites are needed to clear up confusion in southwestern Nova Scotia.

Reid site

St. Margarets Bay, Halifax (lat. 44° 38′ 40″ N, long. 63° 54′ 55″ W). Stratified prehistoric site, attributed to Micmac. Collected 1960 by J. S. Erskine, Wolfville, Nova Scotia. Submitted by A. H. Clarke, Jr., Nat. Mus. Canada. Sources: Clarke and Erskine 1961; Erskine 1962; Isotope, Inc. II: 40; Saskatchewan IV: 233–4.

I-217: 700±225; A.D. 1250. Snail shells (*Littorina littorea* (Linn.)). Sample of twelve, average height *ca.* 15 mm.

S-153: 600±45; A.D. 1350. Charcoal from third level, lowest of three and only one with culturally datable artifacts, consisting of small corner-notched projectile points of semi-crystalline silicious material.

S-187: 500±60; A.D. 1450. *Mercenaria* shells from all levels of associated shell heap.

Clarke and Erskine note that status of *Littorina littorea* and of *Ceprea hortensis* (Miller), which also occurred, as indigenous to the New World was previously doubted. Presence of reindeer bones and crowded lines of growth in *Mercenaria mercenaria* (Linn.) provided evidence that the climate had formerly been colder than at present. It was considered on archaeological grounds that this site would have been occupied for not less than a century between A.D. 1200 and 1500.

Whynacht Cove site

Whynacht Cove, Mahone Bay (lat. 44° 27′ 34″ N, long. 64° 18′ 13″ W). Indian shell heap, three levels. Collected 1960 by J. S. Erskine, Wolfville, Nova Scotia. Sources: Erskine 1961, 1962; Saskatchewan IV: 234.

S-154: 900±50; A.D. 1050. Charcoal from first (uppermost) level.

S-183: 1290±75; A.D. 660. Shell from third (lowest) level.

Erskine notes that the first level contained Indian Garden points, with antler tines of white-tailed deer near the bottom and fragments of caribou antler in upper 8 in. This represents earliest definite find of caribou in Nova Scotia. Oysters are now locally extinct, and no oyster shells were found in upper levels of this site.

D. NEWFOUNDLAND

Curtis site (DjAq-1)

Twillingate (lat. 49° 39′ 30″ N, long. 54° 47′ 30″ W). Archaic Red Ochre burial ground with rich deposit of stone artifacts, including unusually high proportion of ground slate. Burials were deep interments and seem to have been cremations. Samples are all from graves, in association with or mixed with red ochre deposits. Artifacts should date about 3,000 years ago. However, if historic Beothuk were a late-surviving Archaic group, this site might be considerably more recent. Collected 1966 by D. MacLeod and D. Webber, Nat. Mus. Canada. Source: Nat. Mus. Canada file.

GaK-1254 (NMC-121): 3200±90; 1250 B.C. Charcoal from trench A–3, stratum 4A, 25- to 35-in. level.

GaK-1266 (NMC-122): 6920±160; 4970 B.C. Charcoal from trench A, northwest corner, 45-in. level.

GSC-758 (NMC-123): 3560±140; 1610 B.C. Charcoal from trench A-3, southwest face of trench A, at depth of 37 in. below rocks on top of ochre.

GSC-834 (NMC-124): 3720±130; 1770 B.C. Charcoal from trench A-3, stratum 4A, on top of ochre bed, at depth of 37 to 40 in.

MacLeod finds all the dates acceptable except for GaK-1266, which is too old and may be the result of a small sample size. Excavation subsequent to sample submission indicates that burials were probably not cremations, but that small ceremonial fires were lit in the graves.

Forteau Bay-1 site

Strait of Belle Isle (lat. 51° 29′ N, long. 56° 58′ W). Boreal Archaic site. Collected 1961 by E. Harp, Jr., Dartmouth College Mus. Sources: Harp 1951; Pennsylvania IX: 360.

P-691: 5399±58; 3449 B.C. Charcoal and sand from buried turf layer exposed in blowout in highest dunes of site, associated with artifacts.

Forteau Bay-3 site

L'Anse-aux-Morts, Strait of Belle Isle (lat. 51° 29′ N, long. 56° 53′ W). Boreal Archaic site. Collected 1961 by E. Harp, Jr., Dartmouth College Mus. Sources: Harp 1951; Pennsylvania IX: 361.

P-687: 6086±73; 4136 B.C. Charcoal and sand from buried soil horizon, 20 to 40 in. below present surface in large central blowout lying between two brooks.

P-688: 5993±74; 4043 B.C. Charcoal from turf 1 in. thick, buried 40 in. below present surface, from point midway along west wall of large central blowout lying between two brooks, and associated with flint chips.

Port aux Choix-2 site

Cape Riche, Strait of Belle Isle (lat. 50° 43′ N, long. 57° 24′ W). Spring–summer seal-hunting site of middle Dorset culture. Site lies on 3-acre meadow crossed by minor beach lines at 15 ft and 25 ft above present sea-level. Collected 1961–1963 by E. Harp, Jr., Dartmouth College Mus. Sources: Harp 1951; Pennsylvania IX: 358–60.

P-682: 1859±50; A.D. 91. Charred fat and sand from primary occupation layer in central area of house 2, a dark soil stratum 4 in. below present surface, in association with fragments of steatite cooking pot, bearing traces of some charred material.

P-683: 1593±49; A.D. 357. Charcoal from primary occupation layer in southwest quadrant of house 2, dark soil stratum covered by layer of stones.

P-692: 1736±48; A.D. 214. Charcoal from uppermost stratum of house 2 midden, 8 in. below present surface.

P-693: 1659±48; A.D. 291. Charcoal from lowermost stratum of house 2 midden, 15 in. below present surface.

P-727: 1580±54; A.D. 370. Charcoal from primary occupation layer in house 4, black soil stratum 4 in. below present surface, covered by layer of stones.

P-676: 1502±49; A.D. 448. Charcoal from primary occupation layer in house 5, dark soil stratum 6 in. below present surface.

P-678A: 1986±51; 36 B.C. Charred fat and sand from primary occupation layer in central area of house 6, dark soil stratum 6 in. below present surface, associated with steatite cooking pot.

P-679: 1623±47; A.D. 327. Charcoal from secondary occupation layer in southwest quadrant of house 6, mixed sand stratum 24 in. below present surface.

P-694: 1602±49; A.D. 348. Charcoal from base of black soil stratum in depression within house 10, 10 to 15 in. below present surface.

P-695: 1712±40; A.D. 238. Charcoal from base of black soil stratum in house 10, 8.5 in. below present surface.

P-696: 1509±47; A.D. 441. Charcoal from base of black soil stratum in house 11, 4 to 5 in. below present surface.

P-729: 1538±55; A.D. 412. Charred wood fragments believed associated with infant burial in house 12, 10 in. below present surface.

P-730: 1886±46; A.D. 64. Charred fat and sand from 3 in. below surface of central firepit in house 12, associated with two human burials.

P-731: 1891±56; A.D. 59. Charred fat and sand from front sector of house 13, 8 in. below present surface.

P-732: 2294±51; 344 B.C. Charred fat and sand from point near firebox of house 15, 8 in. below present surface.

P-733: 1565±53; A.D. 385. Charcoal from midden deposit of house 16, 10 in. below present surface.

P-734: 1465±51; A.D. 485. Charcoal from beside central firepit in house 17, 6 in. below present surface.

P-735: 1817±51; A.D. 133. Charred fat and sand found next to small firepit in house 17, 12 in. below present surface.

P-736: 1683±49; A.D. 267. Charcoal from house 18, 6 in. below present surface.

P-737: 1321±49; A.D. 629. Charcoal found on sterile sand in house 20, 6 in. below present surface.

Harp points out the discrepancy in dates corresponding to the sample materials dated: charcoal samples average A.D. 370±13, while charred fat samples average 6±21 B.C. The difference (376±34 years = 11.1 sigma) is certainly significant, but the reason for it is not so obvious since all samples are believed to represent one general occupation phase.

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Chicago III	Libby 1952
Chicago V	Libby 1954
Copenhagen IV	Tauber 1960
GSC II	Dyck and Fyles 1963
GSC III	Dyck and Fyles 1964
Isotopes, Inc. II	Trautman and Walton 1962
Isotopes, Inc. IV	Trautman 1964
La Jolla V	Hubbs and Bien 1967
Lamont IV	Broecker and Kulp 1957
Michigan I	Crane 1956
Michigan III	Crane and Griffin 1958
Michigan IV	Crane and Griffin 1959
Michigan V	Crane and Griffin 1960
Michigan VII	Crane and Griffin 1962
Michigan VIII	Crane and Griffin 1963
Michigan X	Crane and Griffin 1965
Michigan XI	Crane and Griffin 1966
Pennsylvania IV	Ralph and Ackerman 1961
Pennsylvania IX	Stuckenrath, Coe, and Ralph 1966
Saskatchewan I	McCallum 1955
Saskatchewan II	McCallum and Dyck 1960
Saskatchewan III	McCallum and Wittemberg 1962
Saskatchewan IV	McCallum and Wittemberg 1965
University of Washington III	Fairhall, Schell, and Young 1966

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MAP LEGEND

I. NORTHERN CANADA

A. Yukon

Engigstciak: 1
Klokut: 2

B. Northwest Territories

1. District of Franklin

Alarnerk: 3
Annawalk: 4
Avinga: 4
Ballantine: 5
Buchanan: 5
Closure: 4
Ferguson Lake: 5
K'aersut Island: 3
Kaleruserk: 3
Kapuivik: 3
Kemp: 4
Kiliktee: 4
Killillugak: 4
Lady Franklin Point: 6
Loon: 4
McCormick Inlet: 7
Menez: 5
Nanook: 4
Pembroke: 5
Sandy: 4
Shaymarc: 8
Tanfield: 4
Tyara: 9
Umingmak: 10
Wellington Bay: 5
KdDq-8-3: 4
KdDq-13: 4
OdPc-2: 11
OdPq-1: 12

2. District of Mackenzie

Jackson: 13
Narrows: 14
JcRw-3: 15

3. District of Keewatin

Lamb Pegeelak: 16
Manico Point: 17
Native Point: 18
JjLk-4: 16

II. WESTERN CANADA

A. British Columbia

Beach Grove: 19
Courtenay: 20
Cow Springs: 21
Drynoch Slide: 22
Esilao: 23
Garden Island: 24
Hagwilget: 25
Hope: 26
Lehman: 21
Locarno Beach: 27
Lochnore Creek: 21
Marpole: 27
Milliken: 23
Musqueam North: 27
Natalkuz Lake: 28
Pender Island Canal: 29
Stselax village: 27
Whalen: 19
DfRu-13: 30

B. Alberta

Caribou Island: 31
Elkwater Lake: 32
Fullerton: 33
Kajewski: 32
Muhlbach: 34
Old Women's Buffalo Jump: 35
South Battle Creek: 32

C. Saskatchewan

Avonlea: 36
Chamberlain: 37
Gull Lake: 38
Long Creek: 39
Mortlach: 40
Oxbow: 41

D. Manitoba

Long Point: 42
MacBride: 43
Neck: 42

III. EASTERN CANADA

A. Ontario

Bennett: 44
Beswetherick: 45
Burley: 46
Donaldson: 47
Frank Bay: 48
Haines Lake: 49
Heron Bay: 50
Hungry Hall: 51
Inverhuron: 52
Killarney Bay: 53
Lawson: 54
Long Sault: 55
McCluskey: 56
McIvor: 57
Malcolm: 58
Miller: 59
Pic River: 50
Roebuck: 57
Salem: 58
Sand River: 60
Serpent Mounds: 61
Stafford: 62
Sturdy Bay: 63
Summerstown Station: 55
CaGi-1: 64

B. Quebec

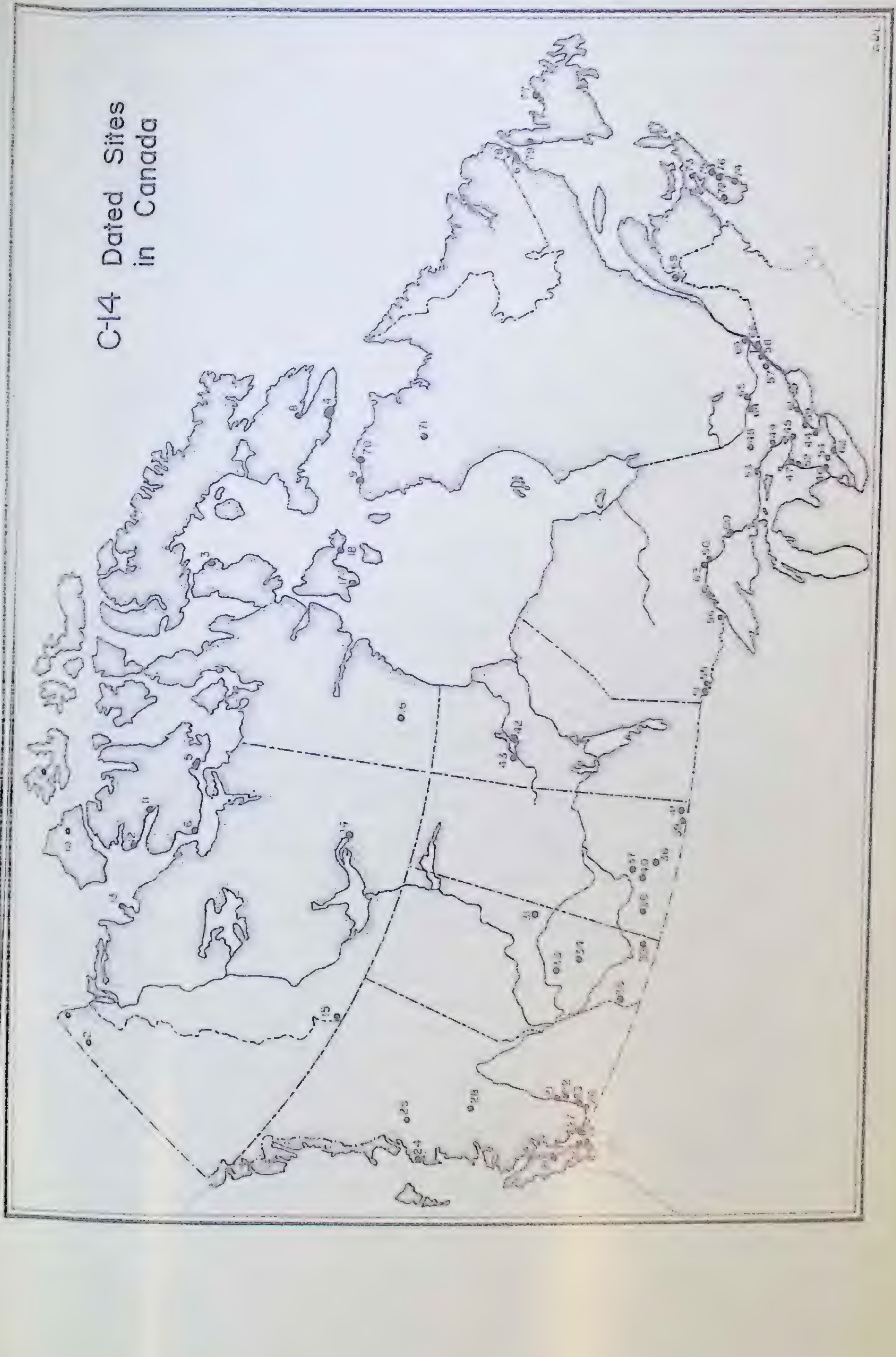
Allumette Island-1: 65
Berry: 66
Blanc Sablon-1: 67
Blanc Sablon-4: 67
Davidson: 68
Dawson: 69
Deception Bay: 70
McInnes: 68
Michea: 71
Morrison's Island-6: 65
Tuktu: 71

C. Nova Scotia

Bear River: 72
Debert: 73
Port Mouton: 74
Reid: 75
Whynacht Cove: 76

D. Newfoundland

Curtis: 77
Forteau Bay-1: 78
Forteau Bay-3: 78
Port aux Choix-2: 79



C-14 Dated Sites in Canada

PRELIMINARY REPORT ON THE MUHLBACH SITE: A BESANT BISON TRAP IN CENTRAL ALBERTA

By

Ruth Gruhn*

RÉSUMÉ

On croit qu'une couche d'ossements découverte sur la ferme Muhlbach, près de Stettler, au centre de l'Alberta, est formée des restes d'un ancien piège à bisons. Les ossements, enveloppés de terre noire, étaient enfouis dans des dépôts sablonneux. Des fouilles partielles ont permis de dégager un amas d'os brisés et désarticulés, qui sont ceux d'au moins une centaine d'animaux. Les pointes de traits qui accompagnent ces vestiges sont de type Besant.

SUMMARY

A bone bed, discovered on the Muhlbach farm near Stettler in central Alberta, is believed to be the remains of a bison trap. The bones, which were enveloped in black soil, were buried in sand deposits. Partial excavation exposed a concentration of disarticulated and broken bones representing at least one hundred animals. Associated projectile points are of the Besant type.

INTRODUCTION

The Muhlbach site (FbPf100) is about 10 miles southwest of the town of Stettler in central Alberta (Figure 1). It is located on the farm of William Muhlbach in the northeast quarter of Section 6, Township 38, Range 20, west of the 4th Meridian.

The site was discovered some years ago when postholes for a corral structure and adjacent fences revealed an extensive layer of bison bones a few feet below the surface. Mr. Muhlbach notified the University of Alberta at Edmonton, but as no archaeologist was in the faculty at the time, he got no response. Mr. Robert Graham of Stettler learned of the site, and with members of the Muhlbach family he made excavations in the area north of the corral. In 1964, Mr. Graham brought the site to the attention of Dr. Alan Bryan and Dr. Ruth Gruhn, who were at that time making a survey of archaeological resources in central and northern Alberta.

Dr. Gruhn conducted excavations at the site during the summer of 1965 while under a professional services contract with the National Museum of Canada. Mr. Muhlbach generously permitted the excavation on his land and allowed the crew the use of an abandoned house as camp. Participants in the excavations were Fraser Taylor, Gertrude Rumbold, John Peck, Kathleen Hicks, Robert Graham, Michael Stonhouse, Rory Daniel, John Bellamy, Norman Proctor, Thelma Habgood, Walter Schowalter, and Timothy Schowalter. The assistance of Karl MacDonald, Gene Gregoret, Sharon Moore, Ross Thomson, and especially Isobel Hurlburt, for laboratory analyses or preparation of illustrations, is gratefully acknowledged.

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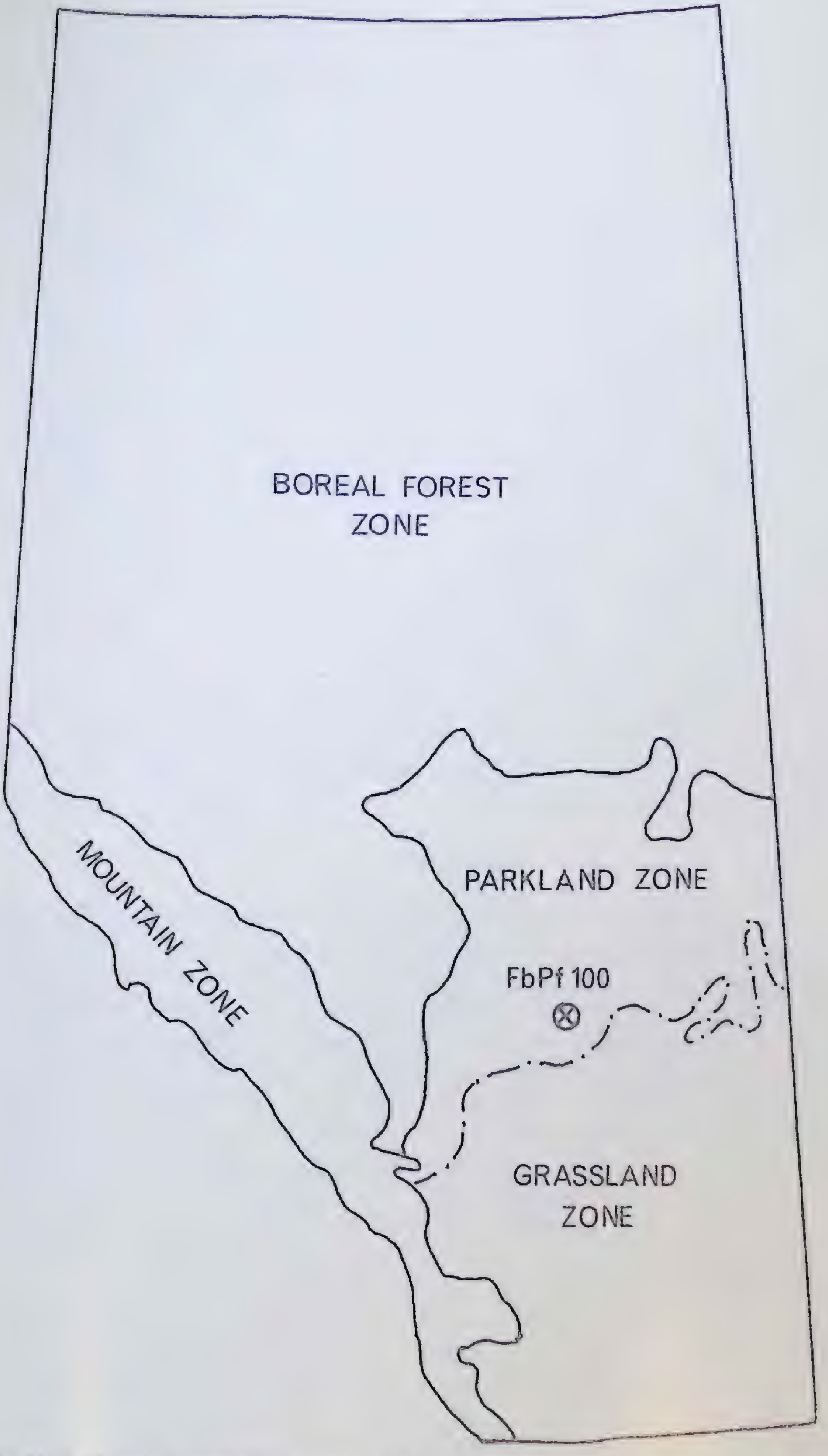

FIGURE 1—Map of major vegetation zones of Alberta (after Rowe 1959), showing location of Muhlbach site (FbPf100).

Since the site lies within the yard area of Mr. Muhlbach's farm, it has not been disturbed by ploughing. Much of the site is actually within the corral, but the area excavated was restricted to the part of the site north of the corral fence (Figures 2 and 3). In testing the site area, a trench 10 metres long divided into two-metre squares was laid out east–west about two metres north of the corral fence; and another east–west trench of equal length was laid out immediately adjacent on the north. This was the 'main area' of excavation. Later in the season a north–south trench one metre wide and 12 metres long was opened east of the fence line and extended north from the corral; another trench one metre wide was run from the first east for a distance of 12 metres into an adjacent slough. Both these trenches comprised the 'north area' of excavation. Subsequently, an extensive area was opened east of the main area; this was the 'east area' of excavation. In addition, test holes were made with a soil auger outside the excavated areas to estimate the perimeter of the bone bed (Figure 2). Altogether, an area of 128 square metres was excavated.

The methods of excavation involved removing by shovel the several feet of sand overburden above the bone bed and then carefully exposing the bones with trowel and dustpan, dental pick, and spoon. The exposed bones in each square were photographed. In the main area of excavation, special care was taken in plotting and numbering each bone exposed, using a stringed grid and recording on graph paper to a scale of 1:10. In the north area the bones exposed were relatively few and scattered and were not plotted. In the east area also, although there was a moderate concentration of bones near the corral fence, the individual bones were not plotted because of a shortage of time. Because of a high-water table, the excavation did not proceed more than about 80 cm into the sand below the bone bed.

ENVIRONMENT

The site is located in a part of central Alberta that was glaciated in late Pleistocene times by the Keewatin ice sheet (Stalker 1960). As the ice withdrew to the northeast, large quantities of meltwater either were drained by spillways, such as that of Big Valley, about 10 miles south of the Muhlbach site, or remained temporarily in the form of shallow proglacial lakes. Such a lake apparently developed in the area of the Muhlbach site (Stalker 1960: Fig. 13) and deposited grey clays and sands. Although the clayey lake deposits were not exposed in the excavations at the Muhlbach site, Mr. Muhlbach reported that the clay occurred at no great depth below surface in the general area.

Following the disappearance of the proglacial lake, winds worked the exposed sand and silt deposits into low dunes. These sand formations now mark the topography of the area, a gently undulating terrain with low sandy knolls and shallow depressions which are often marshy.

At present the area southwest of Stettler lies in the parkland vegetation belt (Figure 1), with extensive groves of poplar interspersed with grasslands. However, I was told that oldtimers have reported that the entire area was treeless open country about 75 years ago. Since that time the parkland belt has evidently been expanding south at the expense of the prairie in this part of central Alberta; similar border fluctuations must have occurred in the past. With the evidence presently available, it is impossible to say whether the

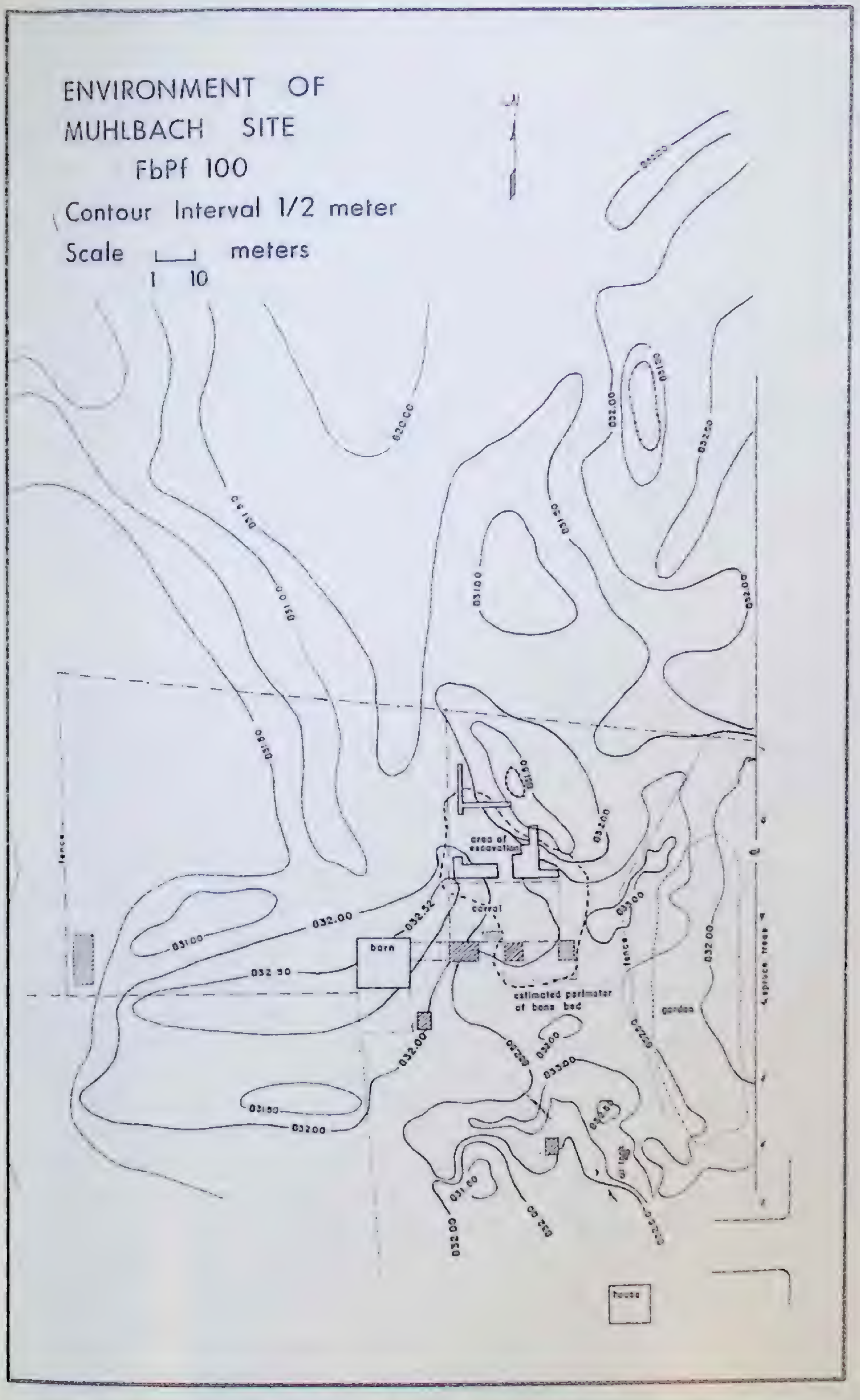

FIGURE 2—Environment of Muhlbach site. Hatchured areas are modern structures.

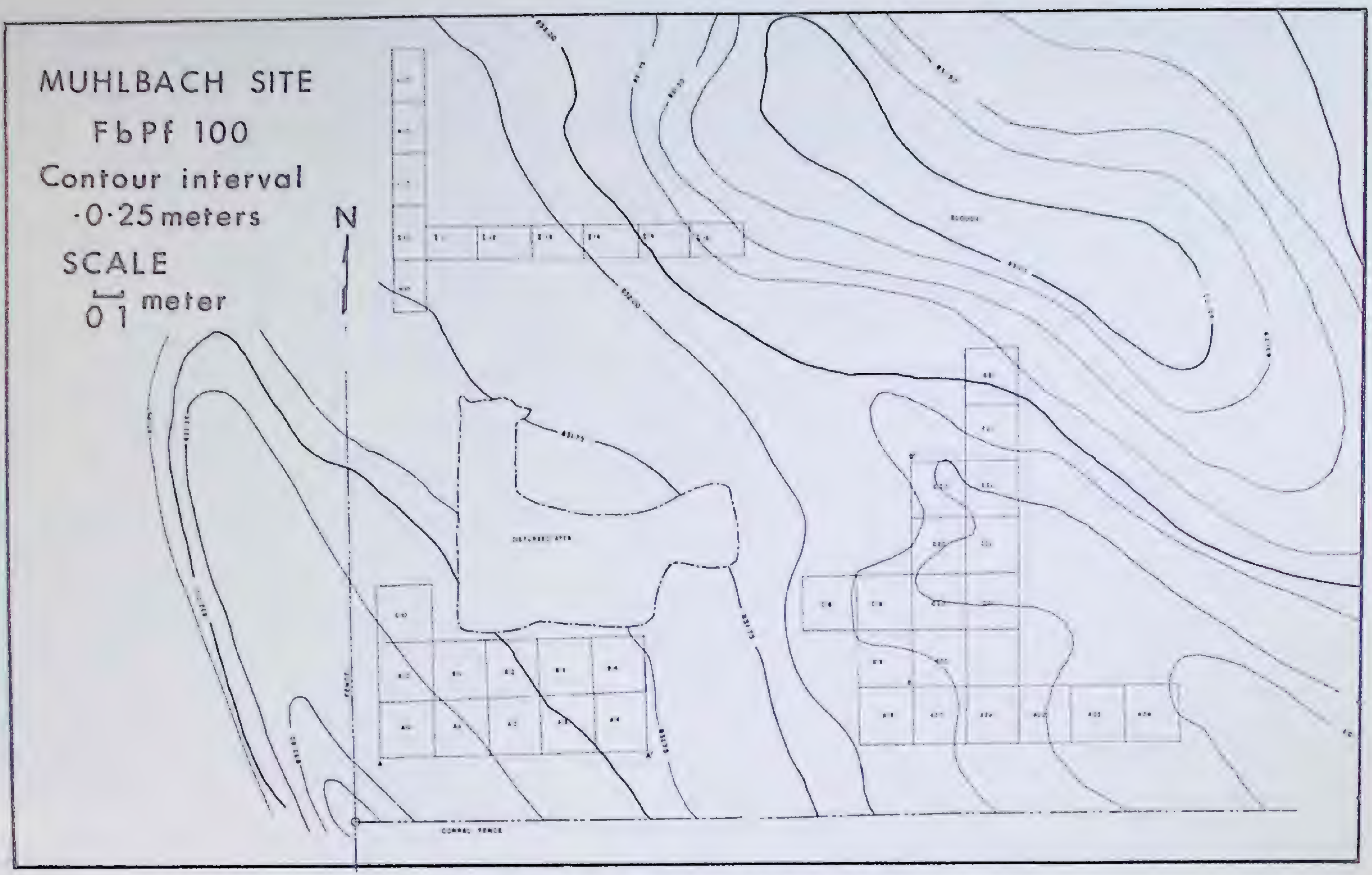

FIGURE 3—Area of excavation at Muhlbach site.

Muhlbach site was in the parkland or in the prairie zone at the time of prehistoric occupation.

The recent soil in the area of the Muhlbach site is mapped as a type called 'Peace Hills Sandy Loam' (Bowser *et al.* 1951). This is a black soil, with a deep A horizon. It is widely distributed on sandy materials in the parkland area of central Alberta.

The Muhlbach site is situated in the midst of small low grass-covered sand dunes (Figure 2). Immediately to the north of the site is a slough, a swampy depression in which poplars and willows grow. It may originally have been the deflation area for an irregular dune that built up over the bone bed in the east area of the site. Test trenches run from the bone bed into the slough from the south and from the west showed that the prehistoric occupational level faded out well outside the lip of the depression.

About 170 metres to the west of the site area is a broad depression partly filled by a shallow pond or swamp (Figure 2). In 1965 the water level in the pond stood about 3 metres below the level of the bone bed. In wetter times the edge of this pond might have extended over the site. Evidence from the matrix of the bone bed, to be described below, suggests that the land was marshy at the time of occupation.

STRATIGRAPHY

The stratigraphy of the Muhlbach site is relatively simple (Figure 4, profile sections AA′ and BB′). Overlying the bone bed is about 50 cm of grey-brown aeolian sand (Zone B), with the modern soil formed in the upper part; over this soil in most areas is a thin deposit of very recent drift sand (Zone A) with thin black layers of compressed manure. The bone bed itself is in a matrix of black sand (Zone C), and it is underlain by a sterile yellow-grey aeolian sand deposit (Zone D) of uncertain depth.

The basal yellow-grey sand deposit (Zone D) is presumably underlain by glacial lake clays; unfortunately, a high-water table precluded test excavations to a depth of more than about 80 cm below the bone bed zone. The yellow-grey sand zone contained numerous hard orange-coloured concretions of irregular size and shape. These oxidized cemented zones are a soil phenomena that may be linked with the AG horizon of a warp anmoor type soil (Weisenboden) in an area with a very high-water table (cf. Kubiena 1953:112).

The matrix of the bone bed is a dark grey to black sand (Zone C) with an average thickness of about 30 cm. The black sand zone sloped downward slightly to the east. The zone was darkest near the base. The upper part of the zone was greyer; and when carefully exposed, the surface of the zone appeared speckled with light spots. The black sand had a greasy feel, and the material was difficult to clean from enclosed bones and rocks. Although the bison bones tended to be concentrated near the base of the black sand zone, often artifacts occurred in the upper greyer zone.

Firm identification of the black sand zone as primarily the result of human use of the site or as a natural soil with modification by human activity will depend on the results of future laboratory analyses. At present there is some evidence that tends to support the latter hypothesis. It is significant that the black sand zone extends beyond the perimeter of the bone bed to the north

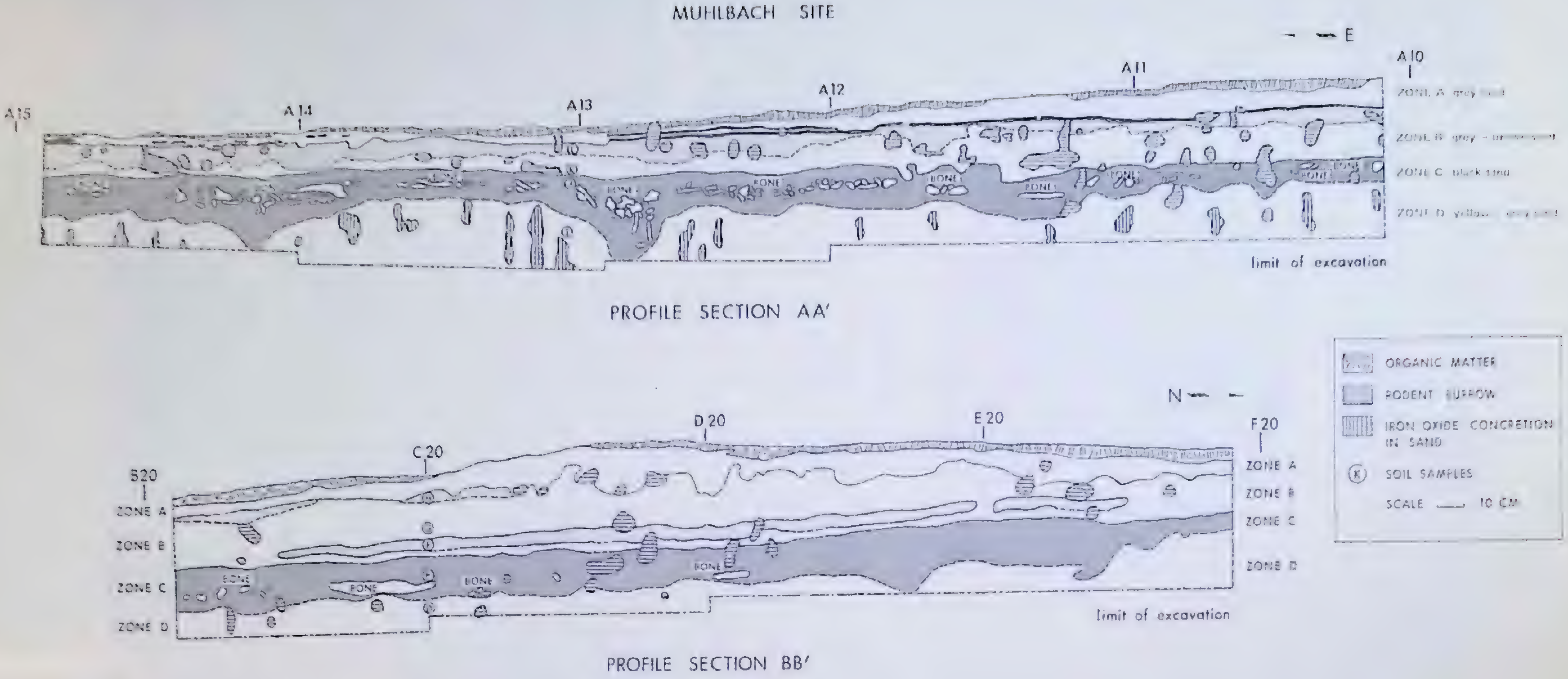

FIGURE 4—Profile sections AA' and BB'.

(e.g., profile section BB′); this distribution beyond the zone of cultural activity suggests that the black sand is a true paleosol zone. The preservation of numerous stems of horsetails (*Equisetum* sp.) in the black sand zone further indicates that this zone represents a marshland soil. And the iron concretions in the underlying yellow–grey sand, described above, suggest that this zone is the AG horizon of such a soil.

The black sand zone which forms the matrix of the bone bed is overlain by a deposit of grey–brown sand (Zone B), varying in thickness from about 40 cm to more than 70 cm. This sand apparently accumulated by wind action since the prehistoric occupation of the site: the bone bed lies at its greatest depth below the present surface in the dune areas. In the east area of the site a 10 cm thick layer of grey sand probably marking a paleosol horizon occurred 10 cm above the black sand zone (Figure 4, profile section BB′). This feature probably represents a brief period of temporary consolidation of the dune in that area early in its development. At the top of the grey–brown sand is a grey zone about 15 cm thick; this is apparently the modern soil, probably Peace Hills Sandy Loam, or one closely related to that type. In the main and east areas of excavation, this modern soil was overlain by a thin deposit of grey drift sand (Zone A) containing varying numbers of thin black layers of compressed manure and a few modern artifacts.

Interpretation of the natural stratigraphy of the Muhlbach site is presently tentative because laboratory analyses of soil samples have not yet been made. One may presume to start with that the yellow–grey sand underlying the bone bed zone accumulated by wind action in the period after the disappearance of proglacial lakes in the area. My present hypothesis is that the black sand zone overlying the yellow–grey sand represents a natural soil that formed under marshy conditions at a time when the local climate was wetter than at present and that a shallow pond to the west spread out to cover the site area. It was at this time that a number of bison were trapped and slaughtered at the spot. Some time afterward the marsh retreated, and small low sand dunes covered the area; these dunes may have derived their constituent material from the exposed floor of the shrinking pond, since the prevailing wind in the area is from the west. By historic times, these dunes had become consolidated under vegetation, and a grey sandy loam soil had formed on the sand covering the site.

THE BONE BED

Bison bones occurred within Zone C, the black sand, in a bed usually about 10 cm below the upper surface of this zone. The bone bed reached a maximum thickness of about 30 cm (Figure 4, profile section AA′) in areas where bone fragments were densely concentrated and piled upon one another. However, only a single layer of bones appeared to be represented.

The estimated perimeter of the bone bed, as determined by the excavations and by testing with a soil auger outside the area of excavation, is indicated by a broken line in Figure 2. It may be seen that the 1965 excavations tested only the northern part of the site; probably more than half of it extends under the corral structures to the south. The entire zone would appear to cover an area of about 1,200 square metres.

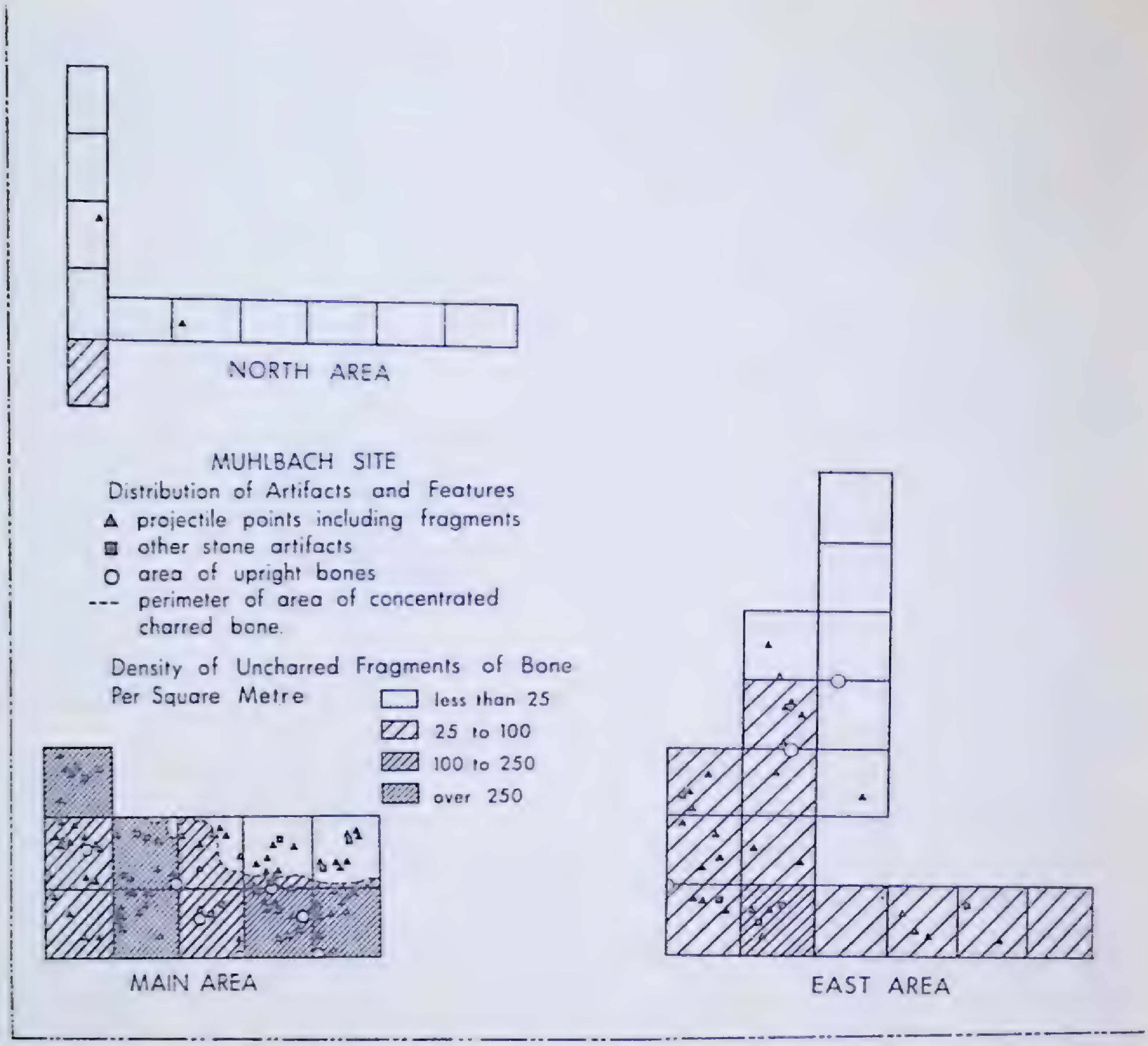
NORTH AREA
MUHLBACH SITE
Distribution of Artifacts and Features
▲ projectile points including fragments
■ other stone artifacts
○ area of upright bones
--- perimeter of area of concentrated charred bone.
Density of Uncharred Fragments of Bone Per Square Metre
less than 25
25 to 100
100 to 250
over 250
MAIN AREA
EAST AREA

FIGURE 5—Distribution of bones, artifacts, and features in the excavated area of the Muhlbach site.

The density of bone fragments in the excavated areas is illustrated in Figure 5. The concentration was greatest in the main area of excavation, where in some squares there were more than 300 bone fragments per square metre and where there was hardly a gap between the bones (Plate I). In the east area of excavation, there was a moderate concentration of bones in the trench nearest the corral fence (Plate II), but the distribution of bones thinned out rapidly toward the north. The individual fragments of bone in the east area, although more scattered than in the main area, tended to be larger and more complete. Very few fragments of bone were found in the north area of excavation, and none were found in the northernmost squares.

The bones were in poor condition. Best preserved were the harder bones, particularly the metapodials, the small foot bones, and the teeth. The marked fragmentation of the bones evidently occurred during the butchering and processing of the bones for food and raw material. Except for a few short columns of vertebrae and several metapodials with phalanges, bones were rarely found in articulation.

The fragments of bone collected from the Muhlbach site have been examined only in a preliminary fashion. A detailed study of butchering techniques and processing of bone will be carried out in the future. At present the following features have been noted about the individual bones:

Cranium. Identifiable fragments of skull were very uncommon. They were in most cases the small hard bone of the ear region, although a few fragments of maxilla were also found. One immature horn core was recovered in the main area of excavation, and one fragmentary cranium with horn cores incomplete was found lying upside down in the north area.

Mandible. The ascending ramus and symphysis were commonly broken off, although some specimens were virtually complete. On a number of specimens the inferior margin was broken.

Vertebra. All classes were abundant in the bone bed, an indication that primary butchering took place where the animals fell. Neural spines and processes were commonly broken; on specimens of the axis the dorsal spine was invariably broken off. A number of apparently unmodified atlases were recovered. In most cases only the upper segment of the sacrum was identifiable. Only a very few caudal vertebrae were recovered.

Scapula. No specimens were complete. On more than half, the entire blade was broken off roughly, at a distance *ca.* 5–10 cm from the proximal end; and on a number of other specimens the thin part of the blade was broken out in a 'V' or 'U' pattern. The dorsal ridge was broken off close to the blade in almost all cases. Two specimens have a dime-sized depressed fracture located *ca.* 10 cm from the proximal end on the dorsal surface.

Humerus. No specimens were complete. The distal end was commonly broken off diagonally at a point *ca.* 10–20 cm from the end of the shaft, most often just below the olecranon fossa. Proximal ends were very rare; the large proportion of cancellous tissue in this part of the bone may have marked it for smashing into small fragments to obtain the marrow.

Radius/ulna. These two bones were rarely found in articulation. There are a number of complete specimens of the radius, but most commonly the distal or proximal end was broken at a point *ca.* 10 cm from the end of the shaft. The shaft of the ulna was usually broken, and frequently the upper part of the olecranon process was broken off.

Pelvis. No specimens were complete. The pubis and ischium were commonly broken off below the acetabulum, and the edge of the ilium was also broken.

Femur. No specimens were complete. The proximal end was commonly broken off diagonally at a point *ca.* 5–15 cm below the head, and the distal end was broken diagonally at a point *ca.* 5–10 cm above the condyles.

Tibia. A few specimens were recovered virtually complete. The distal end was commonly broken diagonally at a point *ca.* 5–15 cm from the end, and the proximal end was broken diagonally at a point *ca.* 10–20 cm below the head.

Metapodials. Most specimens were complete and unmodified. When broken, usually the shaft was smashed diagonally at a point *ca.* 10–20 cm from the proximal end.

Carpals and tarsals. These small foot bones were abundant and appear to be unmodified.

Phalanges. These bones were also abundant. There are several perforated specimens of 1st or 2nd phalange in the collection.

In summary, all but a few of the large limb bones were broken and incomplete; the shafts were smashed evidently to obtain the marrow and perhaps to obtain raw material for tools. Cobbles of igneous or metamorphic rock found scattered through the bone bed may have been used for this purpose. Small fragments of ribs, vertebrae, and shattered limb bones were abundant throughout the bone bed. The blades of scapulae and pelves were also invariably broken. Only small rare fragments of crania were preserved in the site, although mandibles were abundant. The mandibles were probably removed to obtain the tongue; the crania may have been smashed to obtain the brains, or they may have been deposited outside the area of excavation.

The species of bison at the Muhlbach site has not been identified. Bones of immature individuals were noted, but their age at death has not been estimated. A tabulation of bones is not yet complete, but a rough count of mandibles indicates that a minimum of about 100 individuals is represented by the sample from the excavated area. If the distribution of the mandibles is random throughout the total site area, then it might be assumed that at least 300 animals were killed at the spot; but it may be that mandibles of most animals were disposed of in the site area that happened to be excavated; aside from small foot bones, they were the most abundant identifiable bones in the area, and in some cases they appeared to be stacked (Plate III). Study of the distribution of the different types of bones within the area of excavation is incomplete at present.

In the northeast part of the main area of excavation there occurred dense concentrations of very small fragments of bone charred thoroughly black (Figure 5). Mr. Muhlbach and Mr. Graham report that this material also occurred throughout most of the disturbed area immediately to the north (Figure 3), but the precise dimensions of the area of charred bone are unknown. The small charred bone fragments were distributed abundantly throughout the black sand in this area and in places were very thickly concentrated in small pockets; however, no direct evidence of burning in situ or of wood charcoal was observed. Larger fragments of unburned bone also occurred scattered throughout the zone of concentrated charred bone fragments. Charred bone was not restricted to this part of the site; small fragments also occurred commonly in all other areas scattered among the uncharred bones and throughout the black sand zone.

It is probable that the area of concentrated charred bone fragments marks a special part of the site in which bone fragments were processed to obtain the marrow fat or grease used in making pemmican or in cooking. Leechman (1951) has quoted various ethnographic accounts of the processing of bone for this purpose: the bone was smashed into very small fragments and then boiled in water so that the fat or grease floated to the top, to be skimmed off and stored. However, the descriptions of this process do not explain the thorough charring of the bone fragments, as this state would not be the result of boiling in water. The bone fragments may have been dumped directly into the fire after boiling, or it is possible that the prehistoric occupants of the Muhlbach site in some way roasted or fried the bone fragments directly in order to render the grease. Experimentation would be necessary to clarify how the charred bone was produced.

An interesting feature of the Muhlbach site was the occurrence of a number of pits stuffed with bones of various kinds. In each case a number of large bones had been driven vertically together well into the yellow sand underlying the bone bed zone (Plate IV). The bones stuffed in these pits might include not only long limb bones, such as radii, tibiae, and femora, but also metapodials, mandibles, pelves, vertebrae, or small foot bones. The pits, which varied in diameter from about 20 cm to 40 cm, did not appear to protrude noticeably above the bone layer; they were uncovered and recognized only when the bones from this layer were being lifted.

The distribution of the pits filled with upright bones is illustrated in Figure 5. In the main area of excavation seven of the pits appeared to fall into two parallel lines about 2 metres apart, west and southwest of the zone of charred bone and trending northwest–southeast; the eighth bone-filled pit (in Square B10) in the main area was outside this pattern. The three other bone-filled pits, found in the east area of excavation, also appeared to be in a line, trending northeast–southwest.

Unpublished information indicates the occurrence of similar features elsewhere on the Plains. At the Stelzer site (39DW242) in South Dakota, a Plains Woodland village, numerous groups of bison long bones were found set vertically into the soil (Robert W. Neuman, pers. comm.). These features appeared to be randomly distributed near midden concentrations. There is a radiocarbon date of A.D. 230 ± 75 years from a nearby burial mound believed to be associated with the village. It may also be noted that corner-notched points similar to Besant points are characteristic of the Stelzer site, and Knife River flint is the predominant raw material. Similar bone upright features are reported from unpublished sites in Sioux County, North Dakota, from near Saco, Montana (R. W. Neuman, pers. comm.), and from the Boarding School bison drive site near Browning, Montana (T. F. Kehoe, pers. comm.).

The function of these bone-filled pits at the Muhlbach site is uncertain. Despite the apparent pattern of distribution, there is no evidence that the bones were used to wedge wooden posts; no indications of such posts were found, and the bones were too tightly wedged together to allow room for a post. R. W. Neuman (pers. comm.) has suggested that the bone uprights served as anvils, probably covered with hide, on which bones might have been broken up or stones flaked.

Since the Muhlbach site is situated in relatively flat terrain, it is presumed that the bison were trapped and confined in a constructed pound. However, the trenches that sectioned the northern perimeter of the bone bed failed to reveal postholes or other evidence of a corral structure. It may well be that the trenches happened to miss such features. If the area were swampy at the time, it is also possible that a herd was simply driven into a mire and slaughtered with projectiles.

If the pound or trap had been used more than once, the interval between events was relatively short, since there is only a single layer of bone. However, the large number of individual animals that seem to be represented at the site (at least 100 and possibly as many as 300) suggests that more than one herd was captured. Early descriptions of the bison pounds of historic Plains tribes, for example that of Peter Fidler, a Hudson's Bay Company surveyor (MacGregor 1966:69–70), indicate that a pound or trap might have been used on various occasions over a period of several weeks (and sometimes several times a day) until the stench from the pile of decaying carcasses became too strong and the Indians moved on. In his 1792 journal Fidler (loc. cit.) mentioned a pound holding more than 250 buffalo carcasses, piled five or six deep. Unlike a bison jump, advantageously situated at an obviously good cliff or bluff, a bison pound or trap located in flat country may not have been used more than one season. All evidence indicates that the Muhlbach site is a bison trap that was used only for a very brief period of time, probably by a single group of people.

ARTIFACTS

Projectile points. Projectile points were by far the predominant type of artifact found at the Muhlbach site; only a handful of artifacts of other kinds was recovered. Almost all the points were in the bone bed (Zone C); the few found above or below this stratigraphic zone may have been moved by rodents. The horizontal distribution of the projectile points recovered in the excavation is presented in Figure 5.

The entire collection of projectile points recovered in the 1965 excavations is illustrated in Plates V–VII; in addition, line drawings of a selected sample of these same points are presented in Plate VIII. Mr. Graham's collection from the Muhlbach site is also illustrated (Plate IX), although it is not included in this analysis.

Considering that the site represents essentially a single event in time and occupation by one group of people, the observable variation in size, form, and workmanship of the points is of great interest. A detailed metric analysis of the collection of points from the Muhlbach site will be carried out by Brian Reeves of the University of Calgary as part of a wider study of the Besant point type. Solely in order to facilitate description in this preliminary report, the point collection has been divided into two groups on the basis of workmanship: those bifacially flaked (Plate V, figs. A–D, F–J, L–O; Plate VI, figs. B–H, J–M, O–T; Plate VII, figs. A–E, M; Plate VIII, figs. A–C, F); and those made on trimmed flakes (Plate V, figs. E, K; Plate VI, figs. A, I, N; Plate VII, figs. F–L, N–Z; Plate VIII, figs. D, E, G).

Thirty-six projectile points are included in the category of bifacially flaked points, 59 per cent of the total collection of 61 points that are more or less complete. This category is characterized by well-controlled flaking, with flake scars extending over the entire surface of both faces. The flake scars often trend obliquely across the face of the point, two flake scars from opposite edges meeting; this feature is especially prominent on the blades of the larger points (e.g., Plate V, figs. C, D).

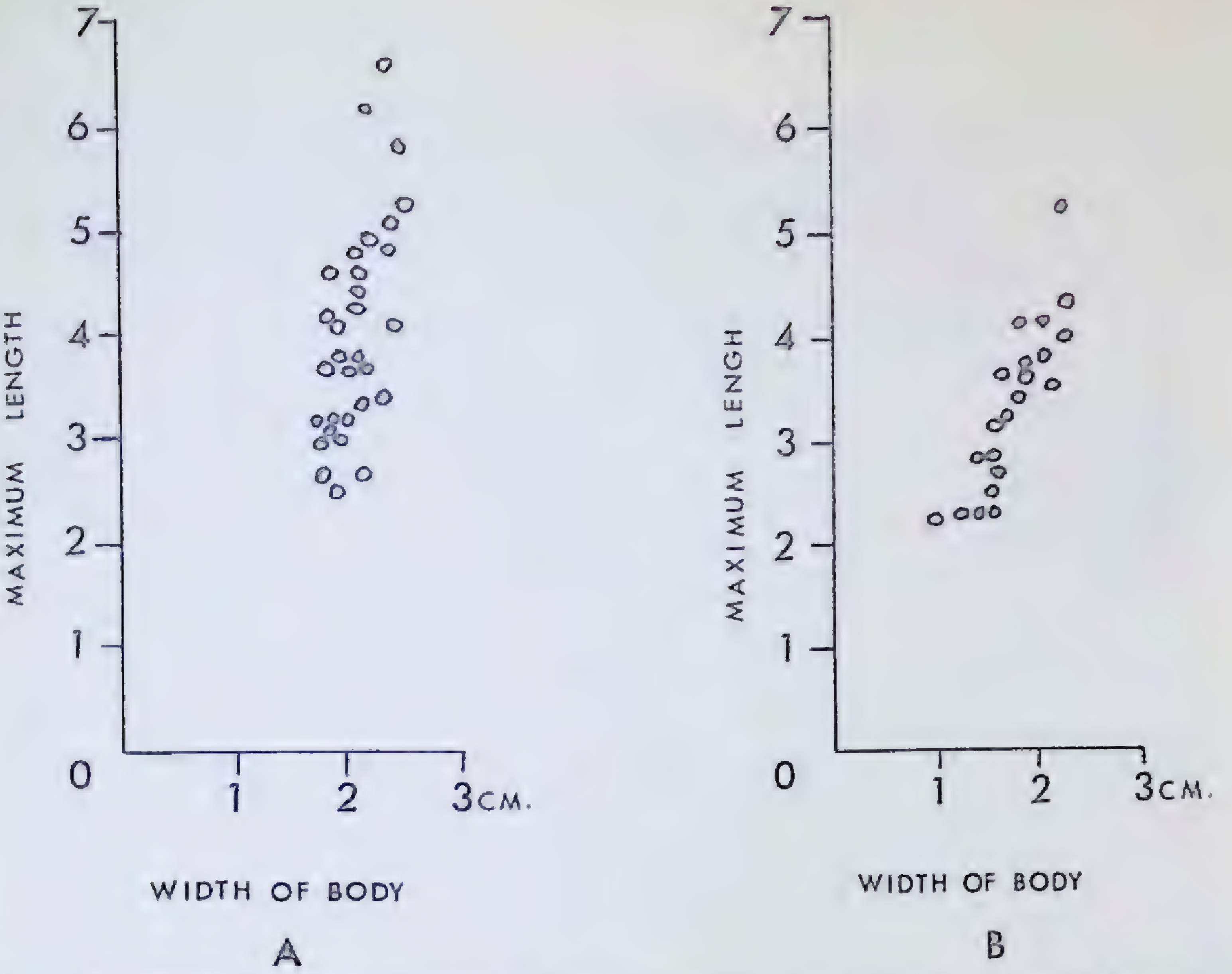

FIGURE 6—Scatter diagrams, illustrating ranges in dimensions of projectile points: A, bifacially worked points; B, points made on trimmed flakes.

The ranges in dimensions of the bifacially flaked projectile points are as follows (cf. Forbis 1962: Fig. 6 for points of measurement):

	centimetres
Length	2.4–6.6
Thickness	0.4–0.7
Width at base	1.4–2.2
Width of body	1.8–2.6
Width at neck	1.3–1.8
Notch width	0.4–1.0
Height of basal edge	0.0–0.7

A scatter diagram (Figure 6, A) illustrates the general size variation among the complete bifacially flaked points. It may be seen that the mode in length is between 3 and 5 cm; only five points were longer than 5 cm, and only five were shorter than 3 cm. The mode in body width is between 1.7 and 2.5 cm.

There was considerable variation in form of base. A straight base was most frequent, 44 per cent of this group; but 31 per cent were concave and 25 per cent convex. Conformity in shape of base is evidently not a distinctive characteristic of these points. It is notable that 83 per cent of the specimens featured light to moderate basal grinding, often extending into the notch area (cf. Plate VIII).

The form of the blade varied from lanceolate among the longer specimens to triangular among the smaller. The edge of the blade was convex in 89 per cent; the edges were straight in 10 per cent; and on one specimen with a thick blade one edge was concave (Plate VII, fig. A). The predominant type of notching was corner-notching or corner removal; two specimens appear to be side-notched (Plate V, fig. A; Plate VI, fig. G). The shoulder is sloping and is often rounded.

Of the bifacially worked points, 89 per cent were made of the brown chalcedony known as Knife River flint, the primary source of which is in North Dakota, although the material has also been found in river gravels in southern Manitoba (Hlady 1965). Of the remainder, six specimens are made of a different variety of chalcedony; one is of silicified wood; one is of black chert; and one is of grey quartzite. These last two minerals are the most common local raw materials used in most of prehistoric Alberta, yet they are very rare at the Muhlbach site. Foreign material with superior flaking qualities was evidently much preferred over the local stone.

The category of points made on trimmed flakes comprises a total of 25 specimens. These points do not feature overall bifacial flaking, but rather consist of a flake trimmed into shape by notching and retouch around the edges, leaving the central part of one or both faces of the flake unaltered. In most cases the lack of complete bifacial flaking may be attributed to the original thinness of the primary flake; further work was unnecessary. Workmanship varied considerably; whereas most of the points were carefully shaped, some of the points were evidently made unskilfully or in great haste (e.g., Plate VII, figs. Y, Z).

The ranges in dimensions among the specimens in this category of points are as follows:

	centimetres
Length	2.1–5.1
Thickness	0.2–0.9
Width at base	0.8–2.1
Width of body	0.9–2.2
Width at neck	0.7–1.7
Notch width	0.3–1.2
Height of basal edge	0.0–0.5

A scatter diagram (Figure 6, B) illustrates the general size variation among the points made on trimmed flakes. The mode in length is between 2 and 4 cm, in body width between 1 and 2 cm.

Considerable variation in form of base is also evident in this group. The base is convex on 56 per cent, straight on 28 per cent, and truncated (broken off) on 16 per cent. The edge of the blade is convex on 92 per cent, straight on 8 per cent. Light to moderate basal grinding also occurs in this group of points, on 40 per cent of the specimens. All specimens were corner-notched with sloping rounded shoulders. Again the predominant material (84 per cent) is Knife River flint. Three specimens are of a different chalcedony, and one is made from a fragment of a split pebble of black chert.

In general, the projectile points of the Muhlbach site conform to the type known as Besant. The type was first defined on the basis of material from Level 4B at the Mortlach site in south-central Saskatchewan (Wettlaufer 1955: 39–49). A few Besant points were also found in Level 3 at the

Long Creek site, also a stratified camp-site in southeastern Saskatchewan (Wettlaufer and Mayer-Oakes 1960: 41–43). They also occur in the lower levels of the Walter Felt site near Mortlach in association with Woodland pottery (Kehoe 1964). In southern Alberta, Besant points are found in the lower levels of bison drive sites, such as the Old Women's Buffalo Jump near Cayley (Forbis 1962: 106–109, 112), and the Head-Smashed-In Buffalo Jump, currently in process of excavation near Fort Macleod (R. G. Forbis, pers. comm.). Besant points have also been found in the lower occupation level of the Kenney site, a stratified camp-site on Pincher Creek in southwest Alberta (Wormington and Forbis 1965: 136–138). Surface collections indicate that the type is very widespread throughout southern and central Alberta. Besant points are also well distributed throughout eastern and northern Montana (cf. Davis and Stallcop 1966: 29–31).

A discussion of comparative material must be limited to that illustrated from sites that have been fully published: the Mortlach site and the Long Creek site in Saskatchewan, the Old Women's Buffalo Jump in Alberta, and the Wahkpa Chu'gn site in Montana. Points from the latter site (Davis and Stallcop 1966, Plate 3) show a range in form similar to that of the points from the Muhlbach site. Specimens illustrated from the Mortlach site (Wettlaufer 1955, Plates 6 and 7) and the Long Creek site (Wettlaufer and Mayer-Oakes 1960, Plate 12) are very similar in form to Muhlbach site specimens, and it is interesting that basal grinding was noted on the Saskatchewan points. At the Old Women's Buffalo Jump, a few Besant points were recovered from the Lower Member, Layers 15 through 22 (Forbis 1962: 106–109, 112; Fig. 14, A–G; Fig. 16, A–C). Forbis divided these points into four varieties and postulated chronological differences between the varieties, although he had grave reservations because of the small size of the total sample. All these varieties seem to occur in the Muhlbach site collection, as well as specimens like three other small points from the same levels at the Old Women's Buffalo Jump (Forbis 1962, Fig. 14, N–P). These points were classified as 'Nanton.' Forbis noted basal grinding on the Besant points.

OTHER ARTIFACTS

Only a few stone artifacts other than projectile points were recovered from the bone bed zone. The horizontal distribution of these specimens as a group is illustrated in Figure 5.

Small broad leaf-shaped knife (Plate X, fig. A). This specimen of Knife River flint has been bifacially flaked. It is 4.4 cm long, 2.5 cm in maximum width, and 0.6 cm in maximum thickness. The blade is broken along one edge, but the tool appears to have been used subsequently along that edge.

Fragments of knives. Two other fragments of knives were found. One (Plate X, fig. B) appears to be the butt of an elongate quartzite knife, at least 3 cm wide and 0.9 cm in thickness; the other is a median fragment of indeterminate form, made of siltstone. Both are bifacially flaked.

Scrapers. One square-ended scraper (Plate X, fig. C) and a small fragment of another (Plate X, fig. D) were found in the bone bed. The larger specimen (2.2 x 2.3 x 0.6 cm) may have been made on a truncated blade. Both specimens are of Knife River flint. They are uniface and are steeply trimmed along the edges. The sharp angle at the corners of the bit is notable.

Perforator (?) (Plate X, fig. E). This specimen is of a glossy white chalcedony, which may have been altered by heat. It was found in the zone of concentrated charred bone in the main area of excavation. It is a thick double-pointed uniface implement with blunt ends. The edges of the piece are steeply retouched. Dimensions are 4.4 x 2.2 x 0.9 cm.

Retouched flakes. Five flakes recovered from the bone bed had been retouched along one or more edges. On one specimen (Plate X, fig. F) one convex edge had been blunted by trimming to provide a finger grip, and the opposite concave edge has had small irregular flakes evidently removed by use. This specimen (4.2 x 2.1 x 0.4 cm) is of Knife River flint. Two other specimens of Knife River flint (Plate X, figs. G, H) are smaller and are retouched along both edges. The striking platforms of these flakes are battered and worn; they may have been used as wedges or chisels. One is notched (Plate X, fig. H) and may have been hafted. The other two retouched flakes are thick and larger and have retouching along only one edge; one is of yellow chalcedony and the other of quartzite.

Utilized flakes. Two small flakes of Knife River flint (Plate X, figs. I, J) show signs of use: small irregular flakes have been removed along one or two edges. They were probably used as cutting tools.

Polishing stone (?) (Plate X, fig. K). A small flat pebble of unidentified red stone was found in the zone of concentrated charred bone. It may have been used as a polisher.

UNMODIFIED FLAKES

Unmodified flakes occurred with low frequency throughout the occupation zone. They ranged in size from tiny finishing flakes to thick flakes over 5 cm in diameter. Most flakes were Knife River flint; only a few, the larger ones, were of other kinds of chalcedony, chert, or quartzite. The presence of these flakes indicates that chipping activity, probably resharpening of tools and weapons, took place on the site.

CONCLUSION

The Muhlbach site was a bison trap used briefly by a group of people who used projectile points of the Besant type. The animals may have been trapped in a mire or in a corral, although no evidence of such a structure was found. The trap could have been used to capture several herds. The animals were butchered on the spot, and grease was rendered from smashed bones; some bone was also apparently processed to obtain raw material for tools. Afterwards, the site was abandoned and was eventually covered by low sand dunes.

Samples of charred bone submitted for radiocarbon analysis produced a date of A.D. 680 ± 150 years (GSC-696) for the Muhlbach site. Available radiocarbon dates from other sites with levels containing Besant points in Alberta and Saskatchewan consistently place this type between A.D. 300 and

A.D. 400. In Saskatchewan, the Besant level at the Mortlach site gave a radiocarbon date of A.D. 377 ± 325 years (Wettlaufer 1955: 71), and at the nearby Walter Felt site there is a date of A.D. 354 ± 80 years on a level with Besant points (Kehoe 1964). At the Old Women's Buffalo Jump in southern Alberta, a level with Besant points yielded a date of A.D. 310 ± 60 years (Forbis 1962: 82). The Muhlbach site date was expected to conform to this pattern. While the date may be correct, it is possible that the radiocarbon sample was contaminated by solutions from the overlying manure.

Evidence from the Muhlbach site suggests interesting connections of the people who used this bison trap with the Plains people to the southeast. There is an abundance of Knife River flint from North Dakota. The people who used the Muhlbach site, if they did not bring the material directly from the primary source, were certainly in close trade relationships with those near the source. The parallel between the occurrence of a peculiar feature, bone uprights, at the Muhlbach site and in a South Dakota Plains Woodland village and at other sites in the Dakotas and Montana is of great interest. Besant points closely resemble corner-notched Plains Woodland types. Kehoe (1964) reports the occurrence of Woodland pottery in association with Besant points at the Walter Felt site in southern Saskatchewan. Were the people of the Muhlbach site possibly Missouri Valley villagers who ranged out on the Canadian prairies for a season's bison hunt? For pre-horse days, this hypothesis seems far-fetched, since the distance was great; yet an interesting question is posed for consideration of the Besant horizon in the northwest Plains.

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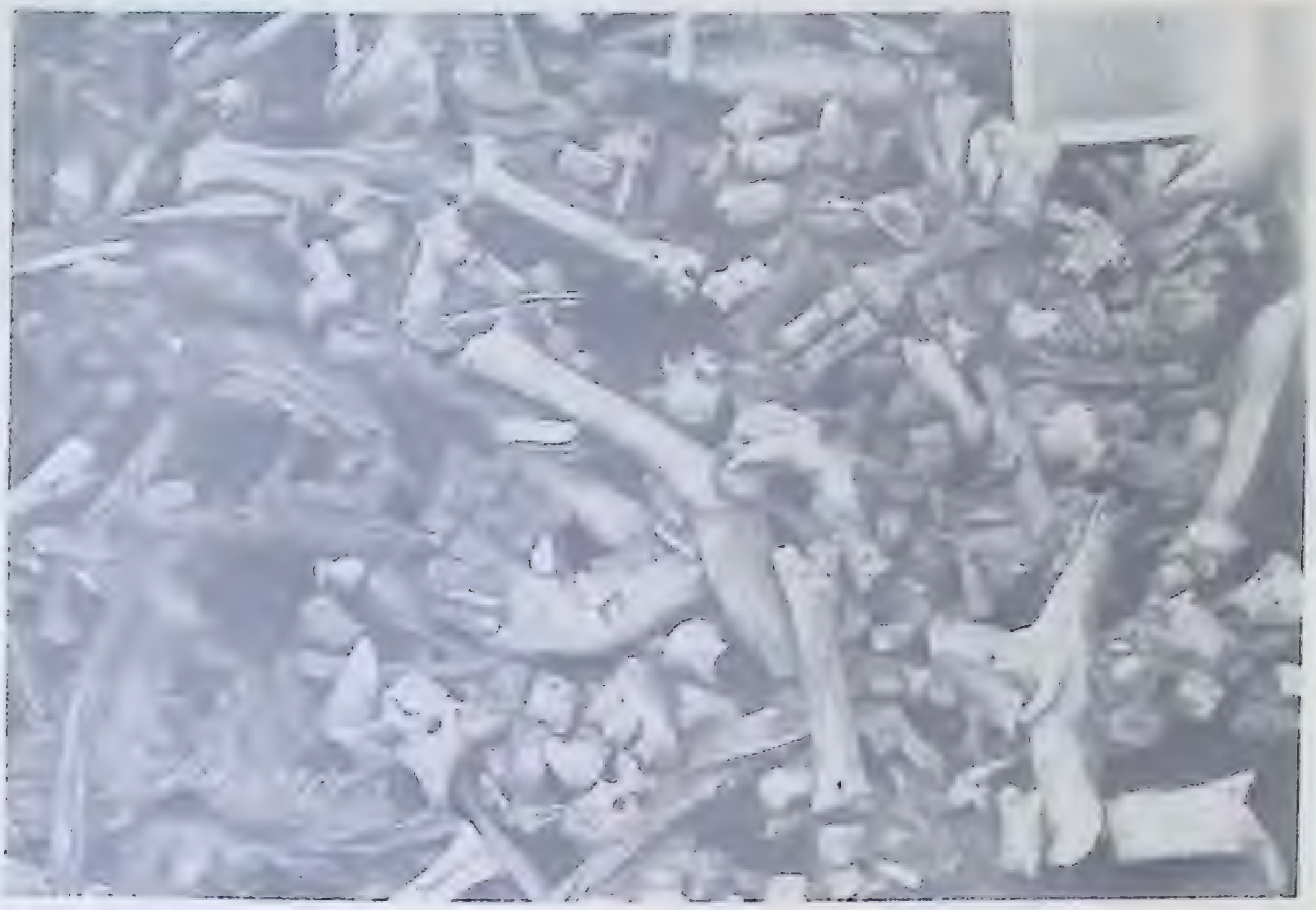
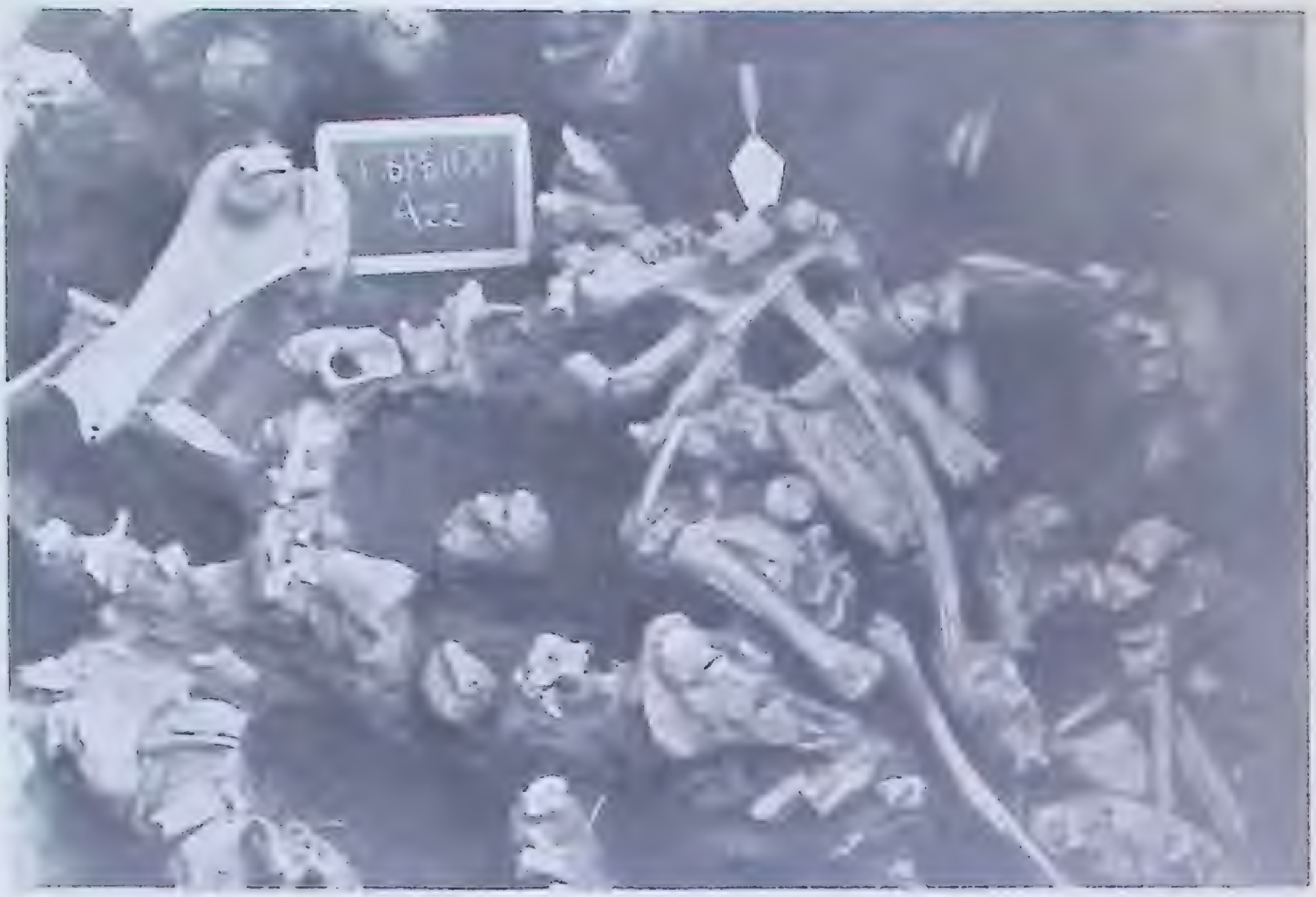
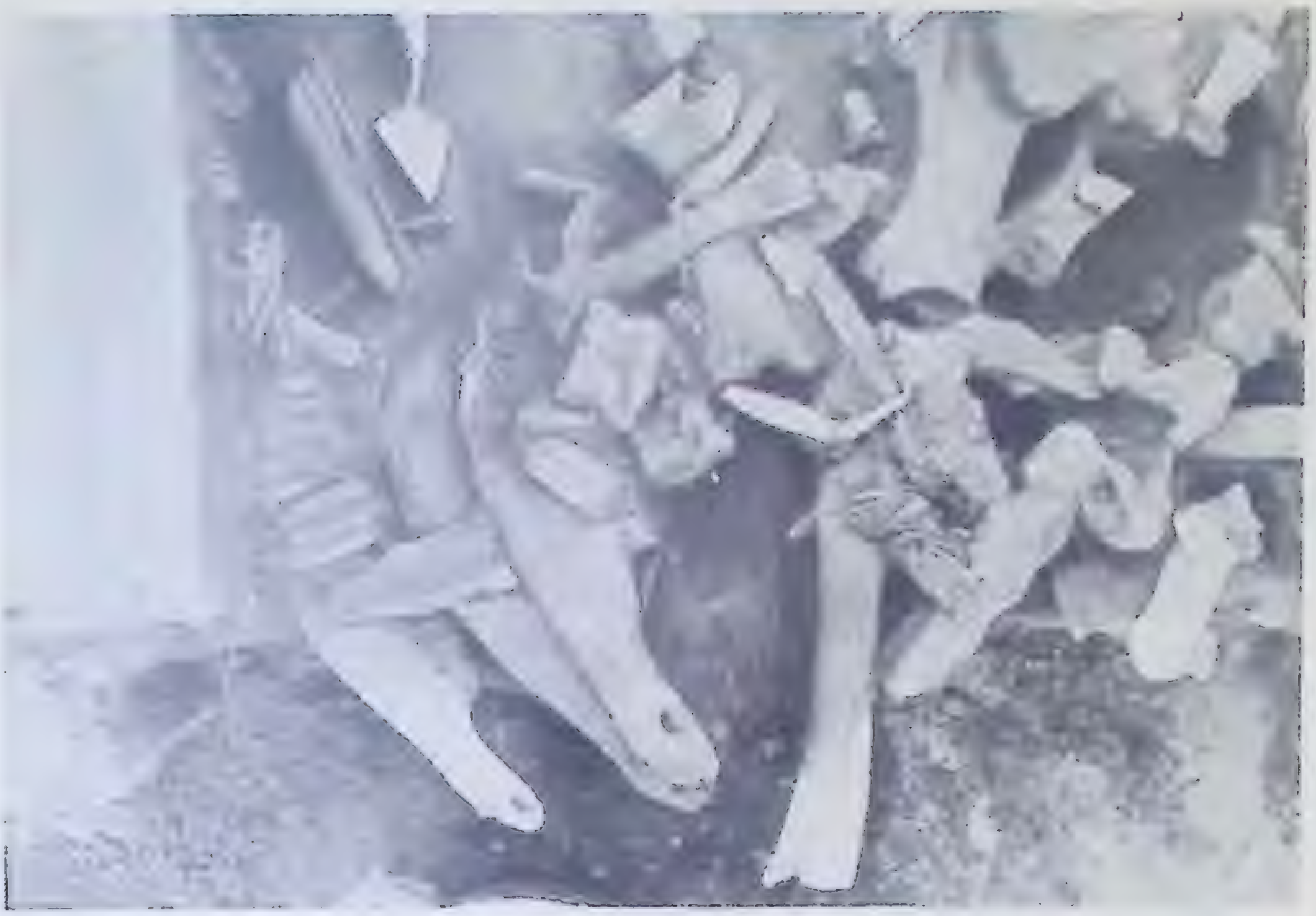


Bone bed exposed in Square A13, illustrating density of fragments in main area of excavation.

PLATE II

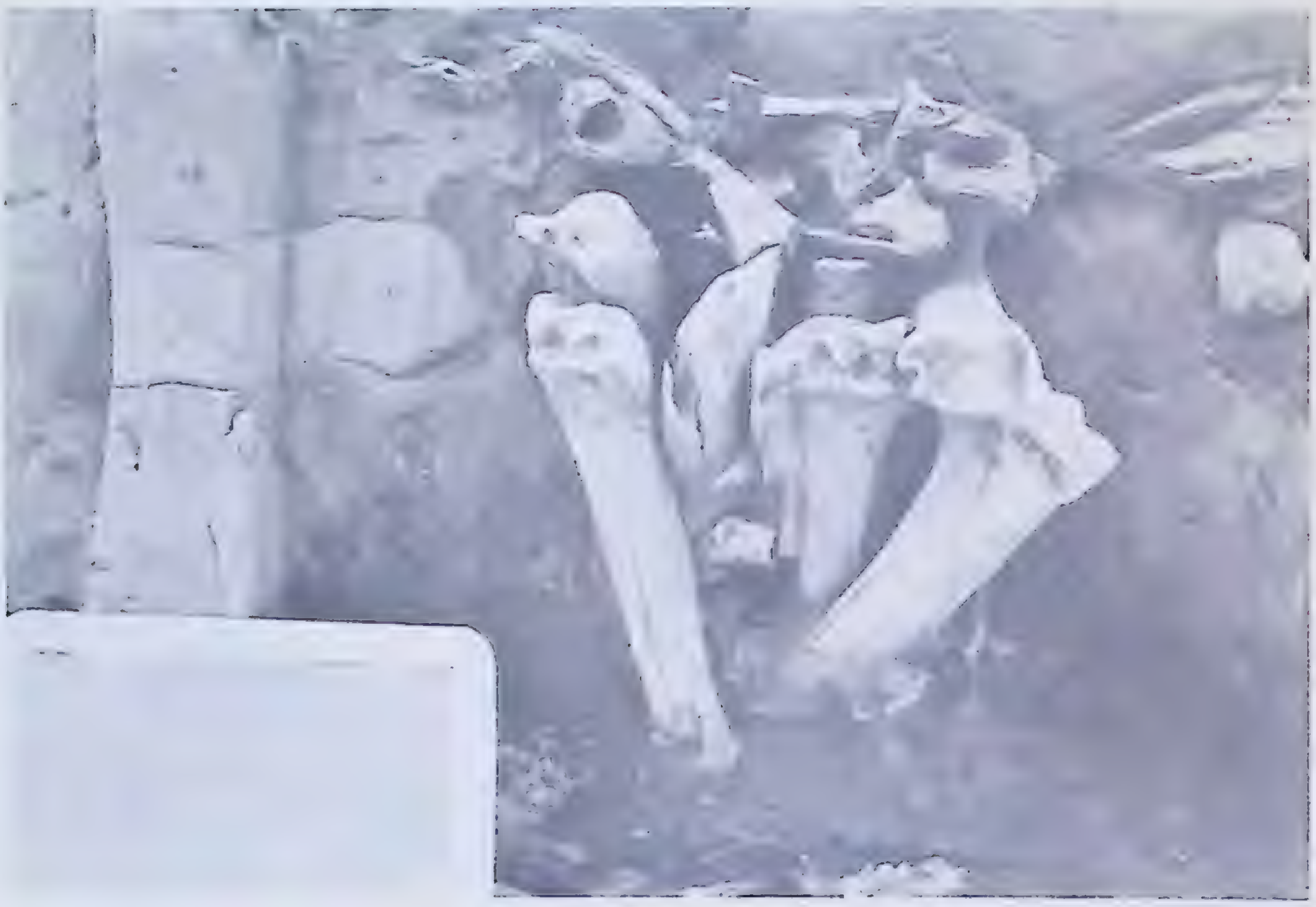


Bone bed exposed in Square A22, illustrating density of fragments in east area of excavation.



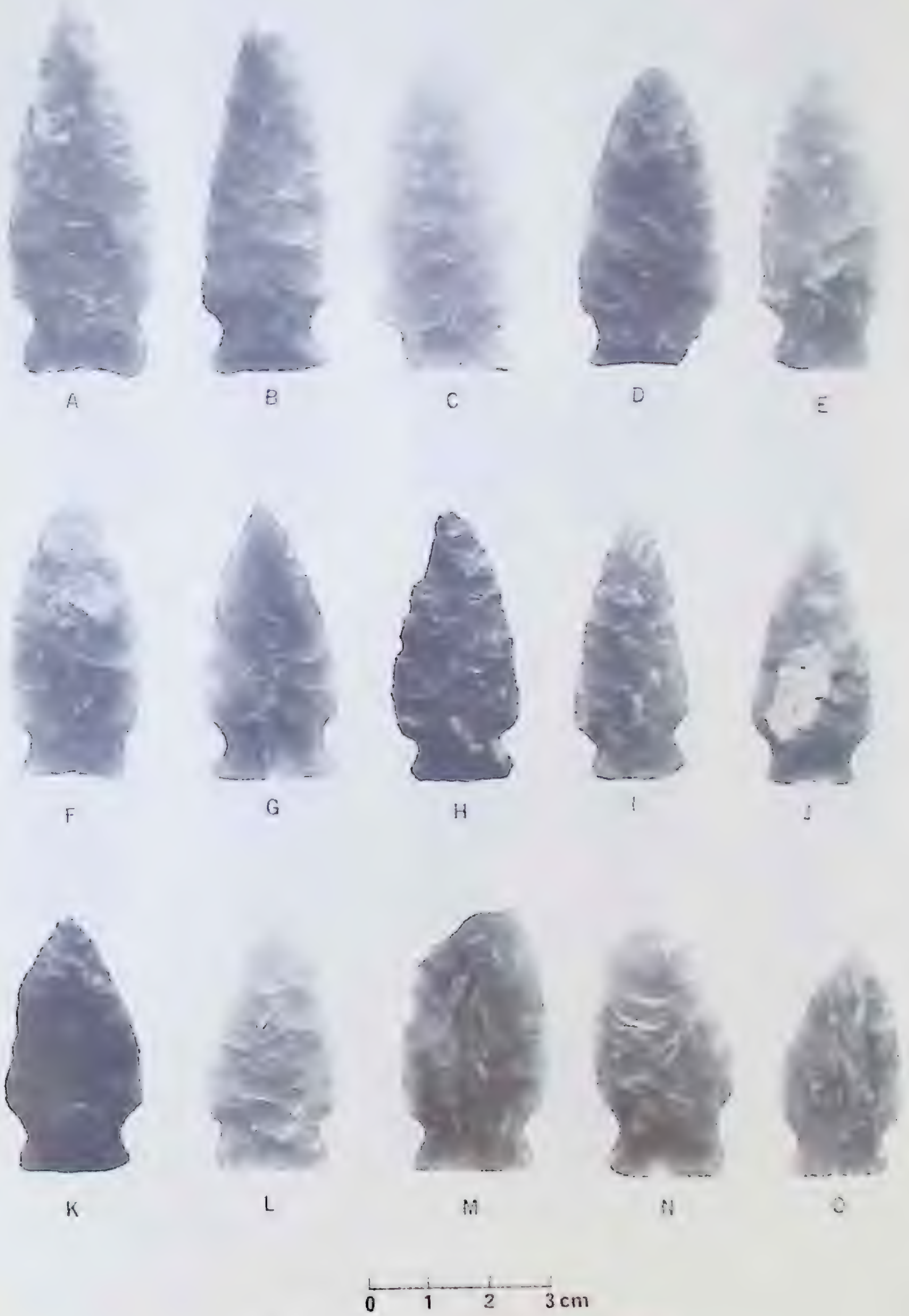
Bone bed exposed in A13/B13 baulk. Trowel tip indicates projectile point in situ. Note stacked mandibles to north.

PLATE IV



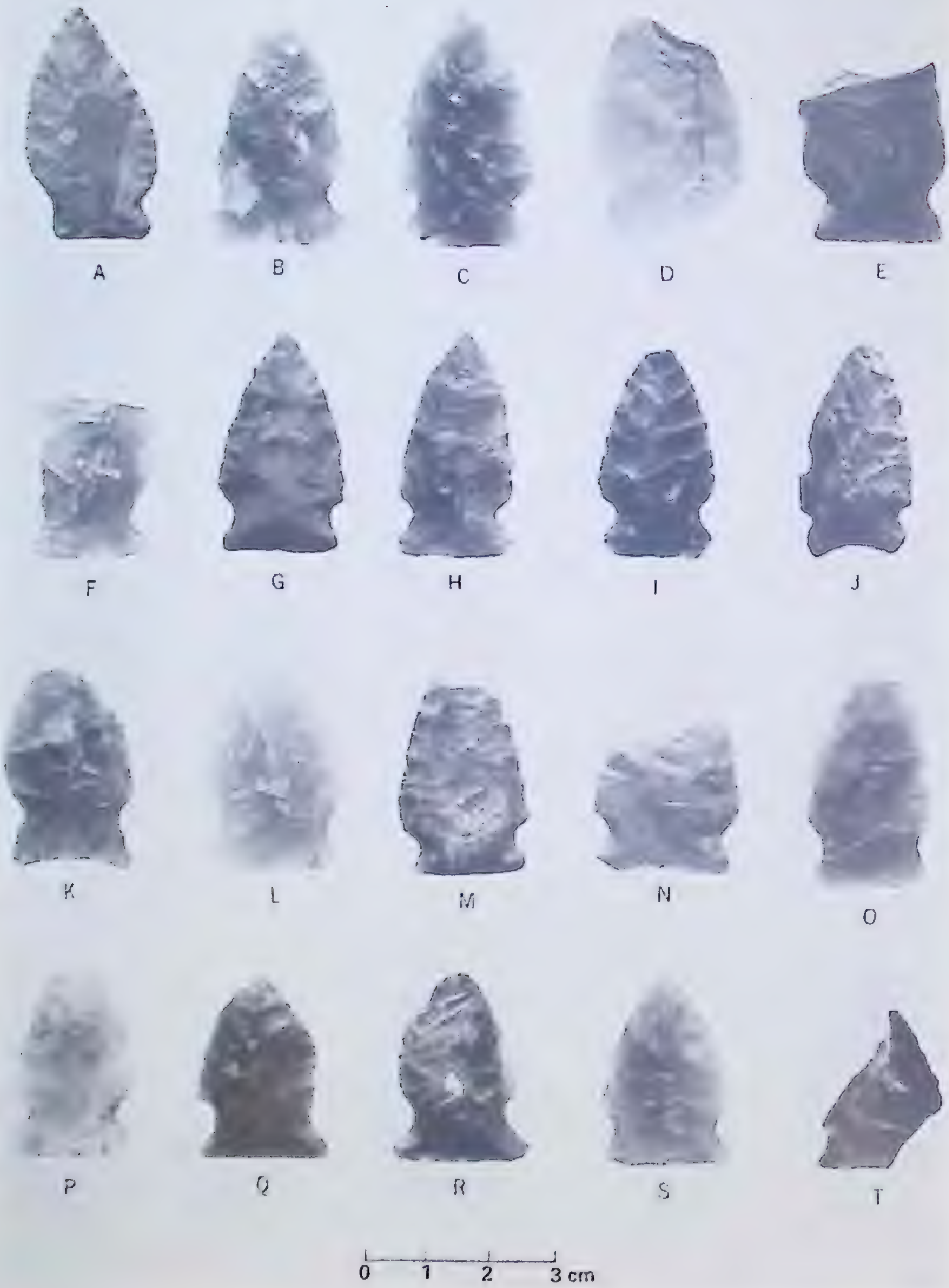
Upright bones in west wall of Square B10.

PLATE V



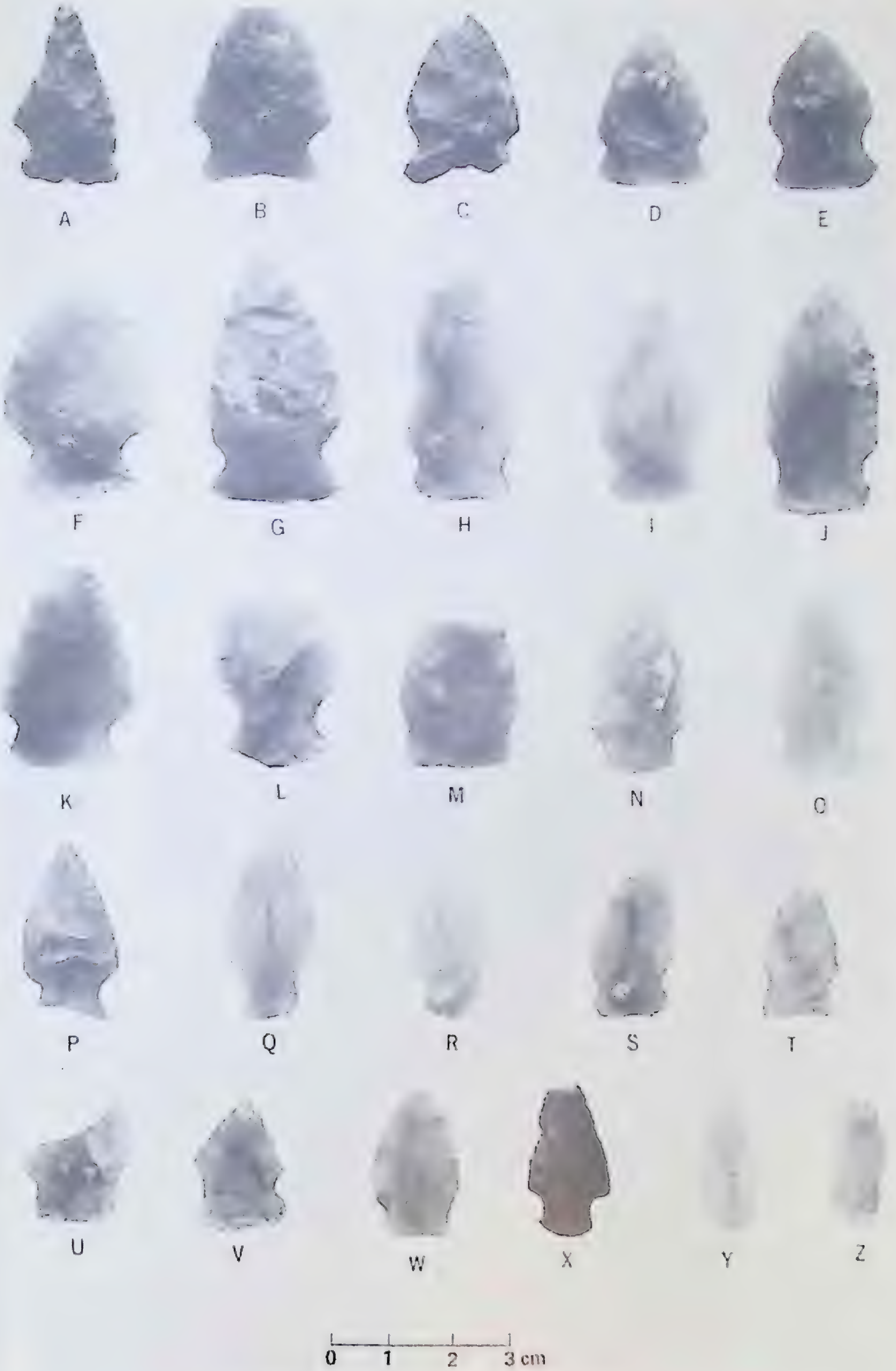
Projectile points recovered in excavation.

PLATE VI



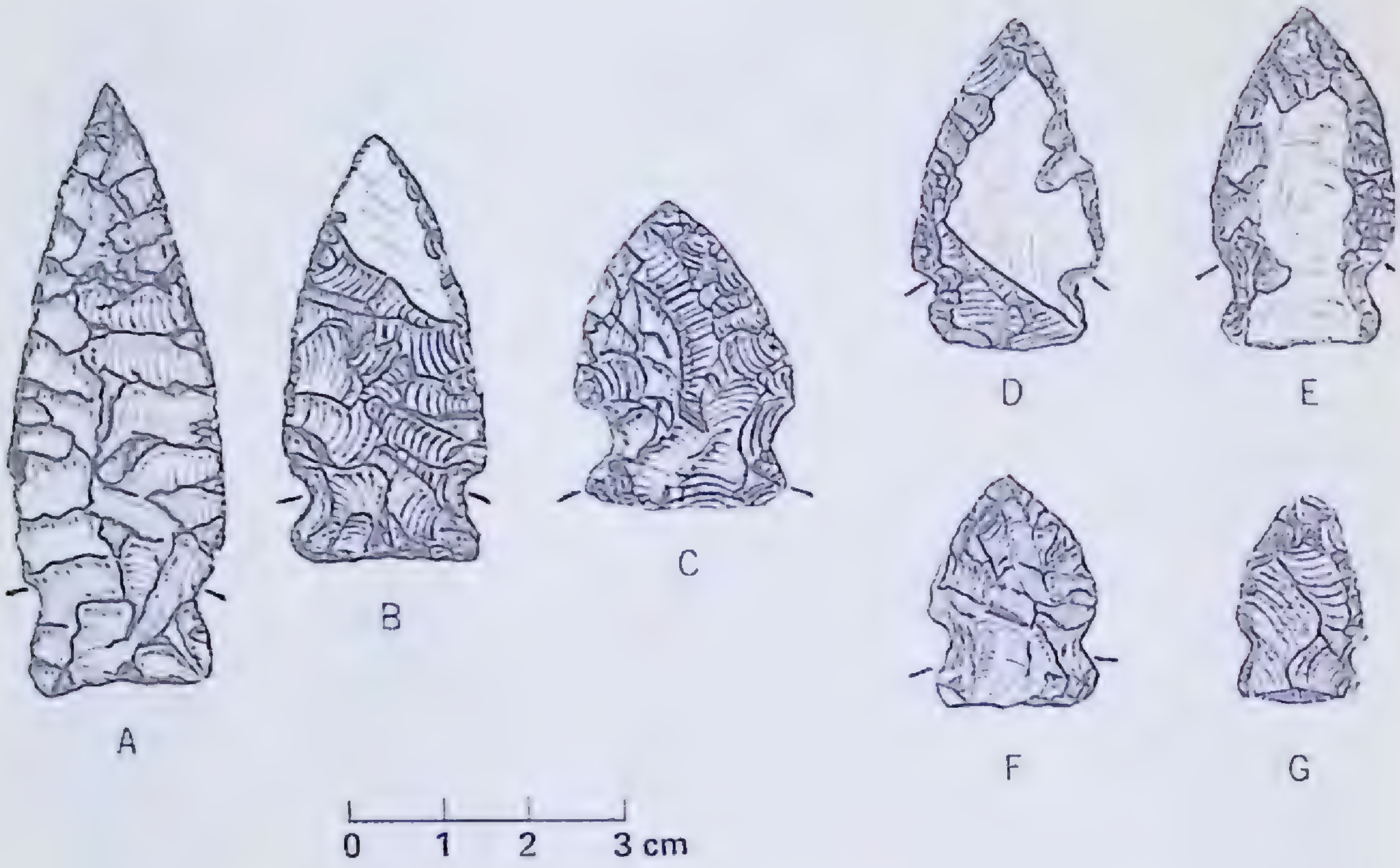
Projectile points recovered in excavation.

PLATE VII

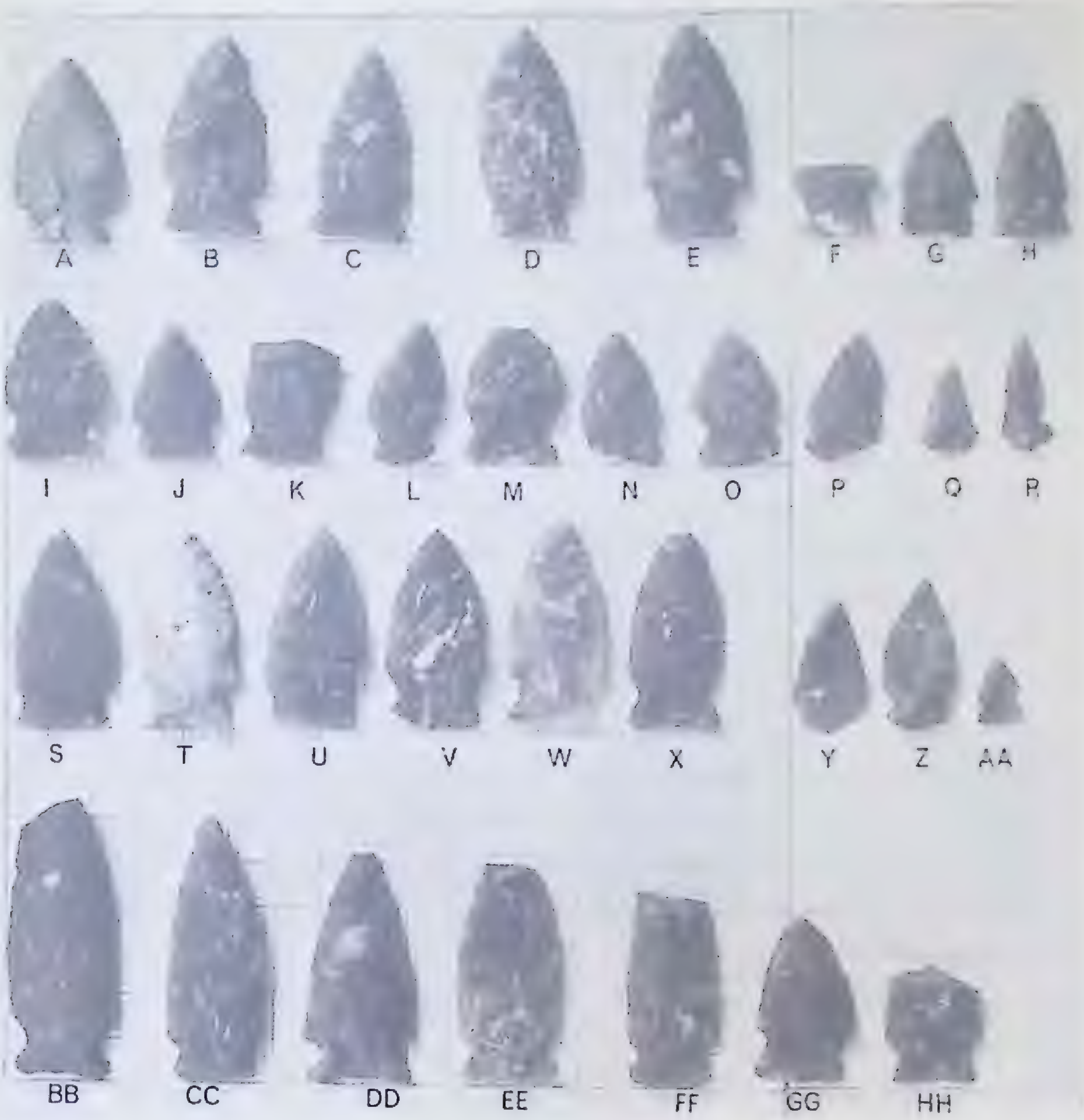


Projectile points recovered in excavation.

PLATE VIII

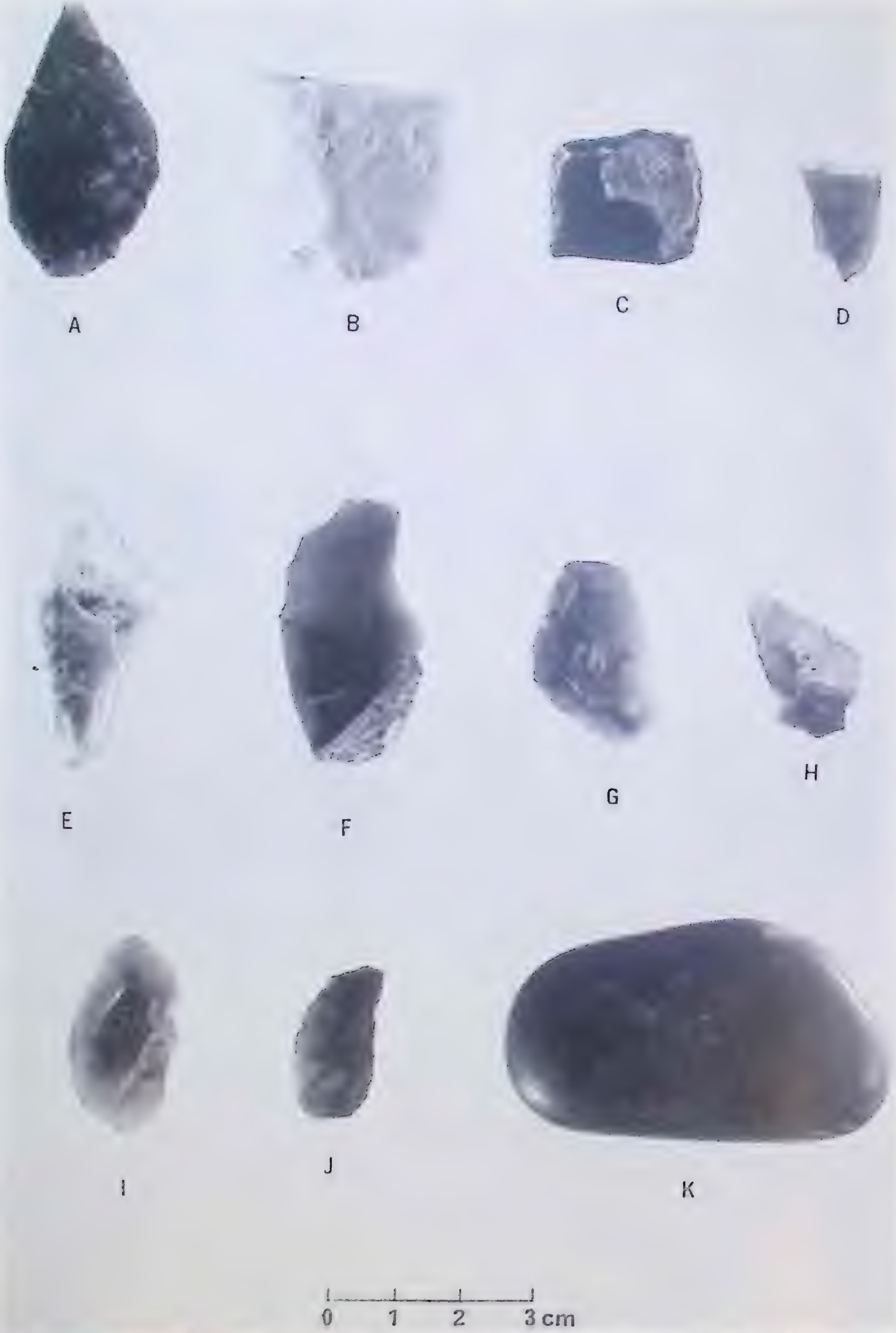


Selected sample of projectile points recovered in excavation.



Projectile point collection of Robert Graham.

PLATE X



Artifacts of other kinds. A, B, knives. C, D, scrapers; E, perforator (?); F–H, retouched flakes; I, J, utilized flakes; K, polisher (?).

AN ARCHAEOLOGICAL SURVEY OF WESTERN VICTORIA ISLAND, N.W.T., CANADA

By

ROBERT McGHEE

RÉSUMÉ

Une exploration archéologique effectuée pendant l'été de 1966 dans la partie occidentale de l'Île Victoria, dans l'Arctique central, a fait repérer 21 sites présentant des traces d'occupation. Deux gisements de la tradition arctique des petits outils ont fourni des petits échantillons d'outils de silex et de basalte, mais aucune trace de l'industrie quartzite caractéristique des gisements Prédorset des Îles Victoria et Banks déjà fouillés. Quatre gisements offrent des vestiges d'occupation des débuts de la période Dorset, tandis que des fouilles sur l'emplacement d'une chasse d'automne au caribou ont mis au jour un bon échantillon d'objets façonnés et de rebuts. Il semblerait que la région ait été peu habitée à la fin de l'époque Dorset, car on ne trouve des indices d'une telle occupation qu'à un seul site. Une variante marquante de culture Thulé ayant subi des influences occidentales a été découverte pendant la mise au jour d'un petit site des maisons d'hiver. Dans plusieurs sites de dimension importante mais peu productifs, on a trouvé des traces d'habitation reliée à la fin de la période Thulé. On a découvert par ailleurs dans un gisement de chasse au caribou du XIXe siècle des objets façonnés des Esquimaux du Cuivre de l'époque antérieure au contact, dont des têtes de harpon qui diffèrent des têtes récupérées des Esquimaux du Cuivre de la période historique, et qui révèlent une nette influence Thulé.

SUMMARY

An archaeological survey of western Victoria Island in the central Canadian Arctic, made during the summer of 1966, delimited twenty-one occupation sites. Two Arctic Small Tool Tradition components yielded small samples of chert and basalt tools, but they lacked the quartzite industry that characterized Pre-Dorset sites previously excavated on Victoria and Banks islands. Evidence of Early Dorset occupation was found at four sites, and an autumn caribou-hunting site was excavated that yielded a good sampling of artifacts and refuse. Later Dorset occupation of the area appears to have been slight, for it is represented at only one site. A distinctive western-oriented variant of Thule culture was recovered during the excavation of a small winter house site. Several large but unproductive sites also indicated later Thule-related occupations. A sample of pre-contact Copper Eskimo artifacts was obtained from a nineteenth century caribou-hunting site where the harpoon heads that were recovered differ from those collected from historic Copper Eskimo and reveal a definite Thule heritage.

INTRODUCTION

The archaeology of the central Canadian Arctic between King William Island and the Mackenzie River Delta remained practically unknown until quite recently. Several ethnologists, including Boas, Murdoch, Steensby, and Birket-Smith, had considered this general area to be the ancestral home of Eskimo culture, yet until 1963 the only archaeological work done in the central coastal area consisted of a few collections and notes made by ethnographers, traders, and other northern personnel. The prehistory of the region had been reconstructed primarily from ethnographic evidence and by extrapolation from more completely known areas to the east and west.

In 1963 the National Museum of Canada initiated an archaeological program in the area, designed to elucidate four major problems (Taylor 1964*a*, 1967, MS.). First, it was hoped that central Arctic components of the Arctic Small Tool Tradition (Irving 1962) could be located, thus forging more archaeological links between the western and eastern Arctic variants of that tradition. Second, an attempt was to be made to trace the western distribution of Dorset culture, which was known at that time only as far west as King William Island, and to assess the possibility of contact between Dorset and western Arctic cultures. The third problem involved the delineation of the eastward extension of western Arctic cultures and the origin and spread of Canadian Thule culture. Taylor (1963) suggested that Birnirk culture had extended at least as far east as Cape Parry, and that Canadian Thule culture had developed from this eastward extension. An attempt was to be made to test this hypothesis. The final problem concerned the origins of Central Eskimo culture, especially that of the historic Copper Eskimo. It was hoped that archaeological evidence would either confirm Jenness's (1923) hypothesis of the inland origin of Copper Eskimo culture or, alternatively, suggest a coastal development from a central Arctic variant of Thule culture.

In the 1963 survey, W. E. Taylor (1964*a*, 1965, MS.) located a Pre-Dorset (Arctic Small Tool Tradition) component in the Ekalluk River area of southeastern Victoria Island, extended the known distribution of Dorset culture as far west as Dolphin and Union Strait, and recovered evidence in southern Victoria Island of a Thule culture variant that subsisted heavily on caribou instead of large sea mammals. Only a few traces of Copper Eskimo culture were found. Taylor returned to the area in 1965 and excavated Pre-Dorset components at Ekalluk River and at Shoran Lake in northern Banks Island. He also located and excavated Dorset and Thule culture sites at Ekalluk River and Cambridge Bay, and carried out a brief aerial survey of the north shore of Prince Albert Sound and the southern part of Prince of Wales Strait (Taylor 1967).

In the summer of 1966 the National Museum of Canada invited me, assisted by Mr. David Lumsden, to continue the work in the central Arctic by conducting a program of archaeological survey and excavation in western Victoria Island, which had not been examined previously from the ground. We hoped to investigate sites in the Minto Inlet area reported by Mr. David O'Brien of the Department of Northern Affairs and National Resources, as well as a large site at the mouth of Kuuk River in Prince Albert Sound reported by Mr. Donald Hamilton of Northward Aviation Ltd. The primary purposes of the survey were to locate additional components of the quartzite-using Arctic Small Tool Tradition variant that Taylor (1967) had excavated at Ekalluk River and Shoran Lake and to find Cooper Eskimo sites that would be sufficiently productive to allow inferences as to the origins of that culture. Although in the first of these purposes we were rather unsuccessful, in the second we had better luck.

Archaeological work was conducted in three areas: the lower course of the Kuujjua River flowing into the south side of Minto Inlet (71°16′N., 11[illegible]°48′W.), the vicinity of Holman settlement (70°44′N., 117°44′W.), and the mouth of the Kuuk River on the north shore of Prince Albert Sound (70°34′N., 112°39′W.). Twenty-one archaeological sites were located, ranging in time from Pre-Dorset to early historic. As most of the sites were small or unproductive, excavation was concentrated on the three largest: the Joss site (OdPc–2), a Dorset culture component at the mouth of the Kuuk River; the Memorana site (OdPq–1), a Thule culture component located a few miles south of Holman; and the Kunana site (OdPc–1), a late prehistoric and early historic Copper Eskimo site at the mouth of the Kuuk River. This report consists of a brief description of each of the sites found and is arranged in probable chronological order from early to late. The site locations are indicated in Figure 1.

PRE-DORSET SITES: OhPo–5 and OdPq–4

Site OhPo–5 is located on the west bank of a small creek that flows into Minto Inlet half a mile west of the Kuujjua River. The site lies on a nearly flat gravel plain with poorly marked beach ridges, 480 to 530 yards inland from Minto Inlet and only 15 feet above sea-level. A very thin scatter of weathered bone scraps extends over an area of approximately 50 by 100 yards; chert waste and artifacts were found in three small surface concentrations located roughly at the corners of a triangle measuring 60 yards to the side. In the same area there are 10 concentrations of cobbles and small slabs; some appear to have been tent rings or caches, but all were disturbed and all large rocks had been removed to build a recent tent ring. Excavation in the vicinity of these structures yielded a few pieces of chert waste, a copper fragment, a Nuwuk Closed Socket harpoon head (Ford 1959: 93), and several fragments of wood and drilled antler. Pre-Dorset artifacts were not definitely associated with any of the stone constructions.

Forty stone artifacts were collected from the surface of the site. All are made of grey chert with sandy inclusions and are so broken that most identifications are uncertain. The collection includes two possible burins made on thin flakes, with the distal ends snapped off and the striking platforms for the burin blows missing. One of the possible burins (Plate I, fig. a), 18 mm wide and more than 21 mm long, has had two vertical spalls removed from one edge; the base and the margin opposite the burin facet have been lightly retouched unifacially. The other (Plate I, fig. b) is 19 mm wide and more than 23 mm long and has a single oblique burin facet; the margin below the facet is unifacially retouched. A possible burin blank (Plate I, fig. c) is made on a slightly thicker flake with a maximum width of 19 mm and a length of over 21 mm; the distal end has been snapped off, perhaps to prepare a striking platform for the burin blow. The edge prepared for spalling is finely retouched unifacially, while the opposite margin has very light bifacial retouch. None of the burins is ground or polished.

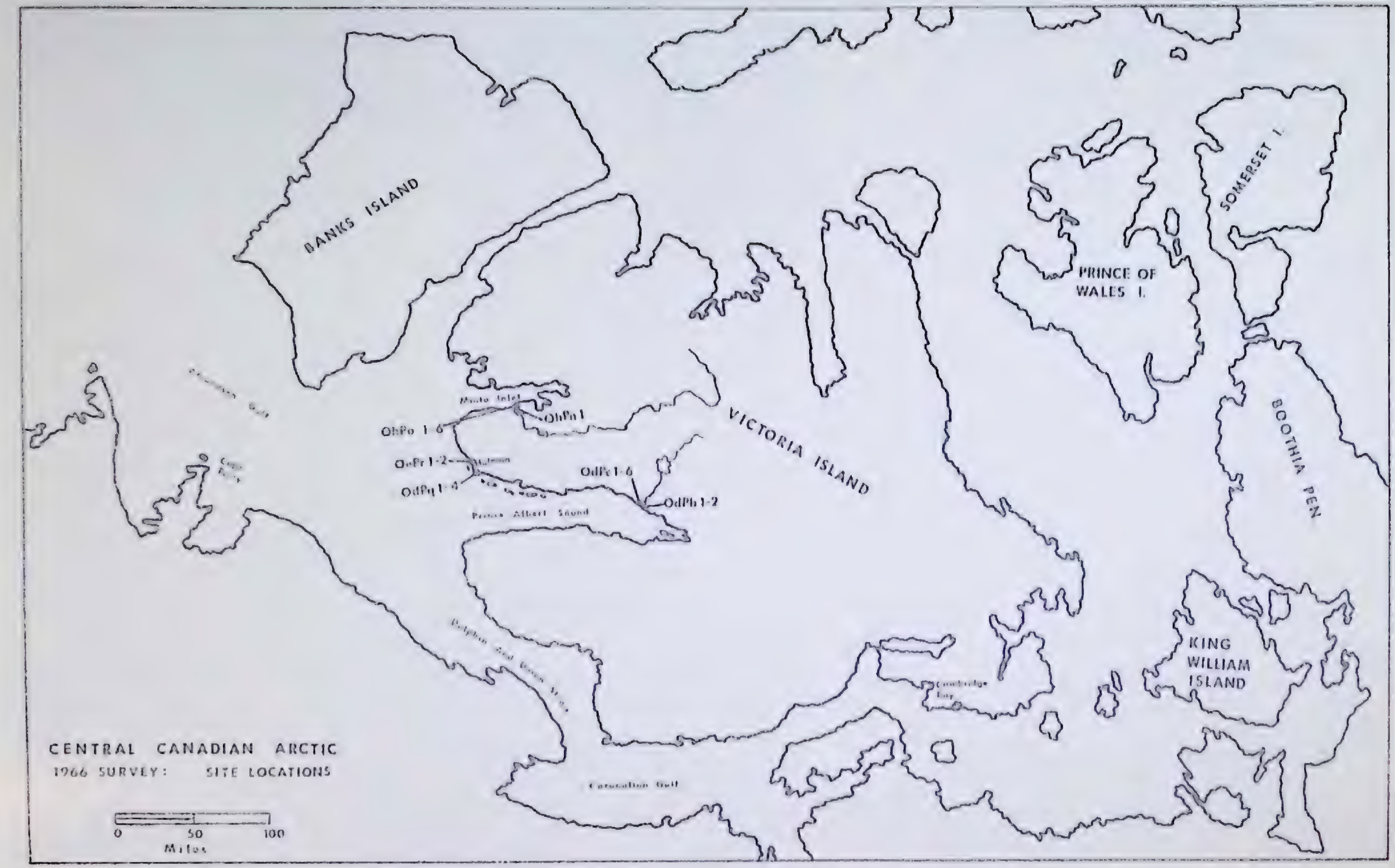


FIGURE 1: Map of central Canadian Arctic, showing location of sites investigated during the 1966 survey.

A possible end blade fragment (Plate I, fig. g) consists of a section of a contracting biface with shallow bifacial flaking, which has produced an unevenly serrated edge. The single side blade (Plate I, fig. e) is ovate, over 19 mm long with one end broken off, 12 mm wide, and 3 mm thick; the edges show fine bifacial retouch. A single endscraper fragment (Plate I, fig. d) has a flat ventral surface and a strongly convex dorsal surface; the scraping edge is 17 mm wide, steeply retouched, and may have been slightly flared.

Nineteen retouched and used flakes show no consistency in form; most are retouched for a distance of less then 10 mm on a single edge. One specimen (Plate I, fig. f) resembles a concave sidescraper but has apparently not been used as such, since the retouched margin is below the concave edge. The fifteen microblade fragments range in width from 5 to 15 mm (mean width 9.0 mm), and in thickness from 0.5 to 3.0 mm. One specimen has two dorsal ridges, and the rest have only one; all are crudely made.

The size and nature of this collection precludes comparison with other assemblages, except that it represents a component of the Arctic Small Tool Tradition. If Taylor (1962: 90) is correct in suggesting that unifacial and unground burins are characteristic of the earlier end of the Arctic Small Tool Tradition sequence in the eastern Arctic, then this assemblage would appear to be relatively early in Pre-Dorset time. The extremely low elevation of the site above present sea-level may be explained by the fact that this area was close to the limit of Wisconsin glaciation and that consequently there was relatively little isostatic rebound in late post-glacial time (Fyles 1963: 34, 36).

Site OdPq–4 is located eight miles southeast of the settlement of Holman. The site lies on gravel beach ridges 27 feet above present sea-level, 200 yards inland from Amundsen Gulf, and faces a small tundra pond of only two feet above sea-level. If the relative sea-level during the occupation of the site had been only a few feet higher than it is now, the site would have been located on the inner side of a long point. Stone waste and artifacts were found in four small surface concentrations occurring over a distance of 200 yards. Three of these concentrations were associated with cobbles and small boulders, which may have been tent rings that are now badly disturbed. Taylor (1968) has noted a similar pattern of 'find spots' on Pre-Dorset sites in Ungava. No bone is preserved, and no artifacts were found beneath the gravel surface. A total of fifteen artifacts were found, as well as 165 pieces of stone waste, over half of which was composed of large flakes of black basalt and banded schist.

The single burin (Plate I, fig. j) is 35 mm long and has a maximum width of 21 mm. It is made on a flake of black basalt that haş been retouched bifacially on all except the spalled edge and the distal end of the edge opposite the facet; these edges are heavily ground on both surfaces. Two slightly oblique spalls have been struck from one edge, and the margin opposite the facet has a slight flare and a concavo-convex outline. The single burin spall is grey chert, 6 mm long, and is a secondary spall with edge retouch and slight retouch on the proximal end. A side-notched artifact (Plate I, fig. h) may also be tentatively identified as a burin. This specimen is made on a flake of grey chert 23 mm long and 12 mm wide; a vertical spall has been removed from one longitudinal edge, and the other edge is convex with a shallow notch near the proximal end.

The only end blade found is made from white quartzite, 35 mm long, 12 mm wide, and 4.5 mm thick (Plate I, fig. m); it has a triangular blade, a contracting stem, and a pointed base, with fine serrations on the blade margins. One endscraper (Plate I, fig. k) is made on a flake of black banded schist; it is trapezoidal in outline with a steeply retouched convex scraping edge 24 mm wide. A second endscraper (Plate I, fig. l) is made on a thin flake of black chert; one side of the proximal end has been snapped off, the scraping edge is rounded, and all margins have continuous shallow unifacial retouch. The lone chert blade fragment is 16 mm wide, 2 mm thick, and has a single dorsal ridge. The two microblade fragments are of white chert and are well made with single dorsal ridges; widths are 8 mm and thicknesses are 2 mm. The retouched and used flakes show no consistent form, and all six are made of brown and white banded chert, a material that was frequently used by Dorset culture occupants of the area. Several of the large waste flakes of basalt and schist may have been used, but the nature of the material makes it difficult to distinguish wear due to use from accidental scarring.

This collection is too small for detailed comparison with other Arctic Small Tool Tradition assemblages. The occurrence of a heavily ground and bifacially retouched burin and long straight microblades suggests that the site is relatively late in Pre-Dorset time (Meldgaard 1962: 93–4; Taylor 1962: 89). The certain association of Arctic Small Tool Tradition forms with a heavy concentration of large waste flakes of basalt and schist suggests a comparison with the Dismal 2 assemblage in which several of the large flake tools were made of a similar dark banded stone (Harp 1958: 227–31).

The artifact illustrated in Plate I, fig. i was found on a hillside behind a small bay on the south shore of Minto Inlet (71°11′30″N., 117°25′W.). The specimen was found on the surface 40 feet above sea-level and was not associated with any other cultural material. It vaguely resembles rhomboidal to pentagonal bifacial end blades from Norton culture at Iyatayet (Giddings 1964: Plate 48), Near Ipiutak at Point Hope (Larsen and Rainey 1948: Plate 80), and Sarqaq culture from the Disko Bay region of Greenland (Larsen and Meldgaard 1958: Plate 4, figs. 15–20).

DORSET CULTURE SITES: OdPc–2,3,4,5; OhPn–1; OdPb–2

The Joss site (OdPc–2) lies on a flat gravel terrace a few yards west of the Kuuk River, 29 to 31 feet above sea-level and 450 to 600 yards inland from Prince Albert Sound. A surface scatter of bone, artifacts, and stone waste covers an area of approximately 4,500 square yards, but the greatest concentration of material occurs in an area measuring 20 by 25 feet near the southeastern corner of the site. No structures were discovered, although a hearth was found in the area of greatest concentration of artifacts and refuse. Most of the material was found within two inches of the surface, although in frost cracks the depth increased to as much as seven inches. Surface collecting and excavation recovered 685 artifacts and more than 900 identifiable bone fragments. The composition of the bone refuse was determined to be 63 per cent caribou, 15 per cent bird, 13 per cent seal, and 9 per cent muskox; fish bones were scattered throughout the site and concentrated in the hearth area.

Twenty-two small triangular harpoon heads were found. Twenty of them are of a type: self-bladed with sharp bilateral spurs, deeply concave U-shaped and slightly chamfered base, completely closed rectangular socket, gouged slanting line hole, well-developed groove running proximally from line hole to base on the upper surface, and rhombic cross-section, tapering distally to a sharp point. Lengths range from 33 to 72 mm with a mean length of 50.4 mm. Of the remaining two specimens, one differs in having the socket partially opened on the upper surface by a slice running distally from the base. Another has a subrectangular thick cross-section and an end blade slot perpendicular to the plane of the line hole. These harpoon heads (Plate II, figs. a–g) are comparable to those found on the early Dorset T1 site on Southampton Island (Collins 1956: 83) and on the early Dorset beaches at Igloolik (Meldgaard 1962: 3), although the proportion of sliced sockets is much smaller at the Joss site than at either T1 or Igloolik. Taylor found harpoon heads similar to T1 and Dorset specimens in southeastern Victoria Island; of his finds, the Joss site harpoon heads most resemble those at the Ballantine and Buchanan sites at Ekalluk River (Taylor 1967: Plate 8, figs. a–e; Plate 10, figs. b–f) and the Newnham site near Cambridge Bay (Taylor MS.).

Three barbed harpoon, dart, or lance heads were found. One of these (Plate II, fig. h) has an open socket with lashing bed, a rounded dorsal spur, a gouged line hole, and two symmetrically opposed pairs of lateral barbs. The second (Plate II, fig. i) is distally broken but appears to have been slightly larger with a single pair of lateral barbs. Similar specimens are reported from the Ferguson Lake site near Ekalluk River (Taylor 1967: Plate 9, fig. h) and the Newnham site near Cambridge Bay (Taylor MS.). These specimens resemble harpoon heads from the lowest 'Sarqaq' beaches at Igloolik (Meldgaard 1960: 74). The third barbed specimen (Plate II, fig. j), which has a single pair of strong barbs and a long pointed tang instead of a socket, resembles two small "dart heads" from the T3 site on Southampton Island (Collins 1957: Plate 7, figs. 13, 14).

Thirteen antler lance head fragments are all of typical Dorset form. One specimen (Plate III, fig c) has a broken chert side blade in place. Two specimens resembling blunt lance heads (Plate II, figs. k, q) may be ice picks. Three antler rods, ranging in length from 72 to 85 mm and with rectangular cross-sections, perforated butts, and wedge-shaped distal ends are tentatively identified as harpoon foreshafts (Plate II, figs. o, p). The remainder of the bone and antler industry includes small barbed dart heads (Plate II, fig. m), antler flakers (Plate III, figs. f, g), incised fragments of long bone (Plate III, fig. o), flat bone needles (Plate III, figs. m, n), a ladle fragment (Plate III, fig. l), an antler adze sleeve (Plate III, fig. d), and several unidentified specimens.

Perhaps the most interesting specimen from this site is a possible antler arrowhead (Plate II, fig. l), the first to be reported from a Dorset culture assemblage. The specimen is 172 mm long (plus an estimated 10 mm broken from the proximal end) with oval cross-section tapering from 7 by 9 mm at the proximal end to 6 by 6 mm at the distal end. The butt is obliquely scarfed and perforated, probably for attachment to the shaft. The distal end has a small split socket for an end blade, and a pair of opposed side blade slots are gouged between 35 and 50 mm from the distal end; these slots connect through the centre of the shaft, and a short incised line runs distally from each slot. Except for the presence of side blade slots this specimen resembles the arrowheads described from the Sarqaq beaches at Igloolik (Meldgaard 1962: 93). Ipiutak antler arrowheads are generally similar but have conical butts and incised lines running the length of the shaft (Larsen and Rainey 1948: Plate 1). A single specimen from Norton culture has opposed side blade slots which connect through the shaft as they do in this specimen (Giddings 1964: Plate 36, fig. 10).

Of the stone artifacts, the largest class (over 200 specimens) is of microblades chipped from local white and brown banded chert. Approximately one-quarter of the specimens are retouched, generally along a few millimetres of each lateral edge adjacent to the proximal end; this retouch is usually dorsal on one edge and ventral on the opposite. A sample of 100 microblades was measured and was found to have a mean width of 7.0 mm and a mean thickness to width index of 27.98. The few complete specimens range in length from 14.5 to 41.1 mm with a mean length of 26.3 mm. The angle between the platform remnant and the dorsal surface of the microblades ranges from 70° to 90°; the lateral angles between dorsal and ventral surfaces range from 15° to 90° but are strongly clustered about a mean of 37°. Most of the eight micro-blade cores that were found are fragmentary; all are relatively crude. They are characterized by irregularity in overall form, by flat striking platforms prepared by the removal of flakes struck from the fluted surface, by a slightly acute angle between striking platform and fluted surface, and by a flat or only slightly convex fluted surface.

End blades form the next largest class: 37 specimens are made from local chert, four from white quartzite. Only four specimens are formed in the small triangular shape that is characteristic of Dorset sites in the eastern Arctic (Plate IV, figs. f, g). Two specimens are fragments of large end blades with contracting stems. The remaining 31 are characterized by expanding stems or by large rounded side notches; the specimens range in length from 27 mm to 57 mm with a mean length of 36 mm, and have shoulder widths that range from 13 mm to 28 mm with a mean width of 20 mm. Three specimens are 'tip-fluted,' and one (Plate IV, fig. e) has had a burin spall removed from one edge near the tip. Most of these specimens can be duplicated from eastern Arctic Dorset assemblages where they occur in generally low frequencies. The high proportion of expanded stem and rounded side-notched forms in this collection invites comparison with the small McCormick Inlet collection from Melville Island (Taylor 1964*b*), the Dorset component of the Buchanan site in southeastern Victoria Island (Taylor 1967: Plate 10, figs. q–s), the Kamut Lake site in the Coppermine River area (Harp 1958: Plate 7, figs. 4, 5), and more southerly complexes such as Lockhart River, which has been noted by Taylor (1959: 41), Harp (1961: 69), and MacNeish (1962: 142) to show similarities to Dorset culture.

Seven small chert side blades (Plate IV, figs. h–k), which vary from oval to crescentic in form are finely retouched bifacially. Four tip fragments from larger and slightly asymmetric bifacial blades were also found (Plate IV, figs. l, m); two are made of local chert, one of basalt, and one of white quartzite. Thirty-four roughly triangular endscrapers were found, all of chert and all made on the same pattern: slightly curved and unretouched ventral surface, strongly convex dorsal surface steeply retouched to a slightly convex scraping edge, and straight lateral edges tapering to a narrow butt (Plate IV, figs. o–r). Lengths range from 20 mm to 32 mm with a mean length of 26 mm; widths of scraping edge range from 14 mm to 22 mm with a mean width of 17 mm.

The 21 ground flint 'burin-like tools' are of standard Dorset form with trapezoidal blades, rectangular stems, and various degrees of grinding on the lateral surfaces (Plate IV, figs. s–v). One extremely narrow distal fragment (Plate IV, fig. u) has had a burin spall removed from one lateral edge. The remainder of the chipped stone artifacts include 21 unifacial flake scrapers or knives of various shapes and sizes, two fragments of large bifaces with parallel lateral edges, and six random form cores. The only ground slate artifacts are a small side-notched end blade or 'burin-like tool' (Plate IV, fig. w) and a fragment of a thin slate end blade with straight lateral edges ground in sharp facets (Plate IV, fig. x).

To summarize, this site appears to have been occupied by a Dorset culture group that was primarily engaged in caribou hunting, fishing, and some bird hunting and sealing. The uniformity of the harpoon heads suggests that the occupation was not of great duration. Similar early Dorset assemblages at the T1 and Alarnerk sites in the eastern Arctic have received four radiocarbon dates ranging from 1000 to 500 B.C. (Rainey and Ralph 1959: 370–1). The Ballantine and Ferguson Lake sites in southeastern Victoria Island, again with similar harpoon head assemblages, have received two dates between A.D. 500 and A.D. 1000 (Taylor 1967: 230). A single sample of charcoal and burned bone from the Joss site yielded a date of A.D. 90 ± 100 (Gak–1257).

Four smaller Dorset sites were found; all appear to represent approximately the same Dorset culture phase as that found at the Joss site. OdPc–3 and OdPc–4, on the west bank of Kuuk River, are respectively 100 and 450 yards upstream from the Joss site. OdPb–2 is on the east bank of Kuuk River opposite OdPc–3. The fourth, OhPn–1, is located on the west bank of Kuujjua River at some rapids five miles upstream from the mouth of the river. In addition to artifacts duplicated in the Joss site assemblage, a fragment of a thin soapstone vessel or lamp was found at OdPc–3 (Plate V, fig. f); at OdPc–4 were found a small slate adze blade with ground bit (Plate V, fig. j) and an antler arrowhead somewhat smaller than that found at the Joss site (Plate V, fig. i).

The only evidence of later Dorset occupation is at site OdPc–5, located on beach ridges 60 feet above sea-level and 2½ miles west of the mouth of Kuuk River. In the midst of a scatter of late prehistoric caches and caribou-drive lanes is a rectangular structure measuring 102 by 25 feet constructed of large slabs and boulders, which still stands to a height of two feet. One end is slightly rounded and there is an opening in one corner. A few fragments of heavily patinated caribou bones and two artifacts were found beneath a heavy growth of moss against the interior of one wall. One is a perforated and notched antler bar which may have been a cross-slat for a small sled (Plate V, fig. o). The other is a harpoon head with a deeply bifurcate base, a rectangular closed socket, a double line hole, and an end blade slot (Plate V, fig. n). This type of harpoon head is regarded as characteristic of middle to late Dorset culture (Taylor 1964*a*: 54). Similar large structures were associated with Dorset material at site NiNg–7 in southeastern Victoria Island (Taylor MS.).

THULE CULTURE SITES: OdPq–1,2; OePr–1,2; OhPo–1,2,3,6

Typical Thule culture is represented only at the Memorana site (OdPq–1), located in a small boggy depression on the top of basalt cliffs overlooking the Amundsen Gulf coast, nine miles southeast of Holman settlement. The site consists of only four houses, which were all excavated; the amount of bone refuse recovered from the houses and the shallow middens suggests an occupation of a single season. The houses are oval in shape and were built on the original ground surface. The floors are lined with slabs, and there are rectangular to semicircular rear platforms raised 8 to 15 inches above the floor on two rows of vertically set slabs and small boulders. Entrances face southwest towards the coast and are slab-walled corridors 4 to 8 feet in length with no noticeable incline. Concentrations of charcoal and burned blubber were found beside the outer ends of two entrances, and small slab caches or storage niches were found on either side of the entrance passages. The house walls are represented by turf rings 18 to 24 inches high, 2 to 5 feet thick, and with exterior dimensions ranging from 14 by 15 to 18 by 20 feet.

A few fragments of wooden posts were found, but the pattern of wall and roof supports could not be determined. Whale bone house supports were not used, despite the fact that whales are presently found in the area while driftwood is fairly scarce. Whale bone was not found in the food refuse, and was present at the site only in the form of three artifacts. Slightly more than 2,000 pieces of refuse bone were examined and identified as 72 per cent seal, 26 per cent caribou, and insignificant percentages of bearded seal, muskox, bird, fish, hare, and fox.

Fourteen of the fifteen sealing harpoon heads are of the Thule 2 type or variants of that type. Only eight of the fourteen specimens have the symmetrically opposed barbs characteristic of the Thule 2 type (Plate VI, figs. d,e). Two have a single strong barb on the edge opposite the spur (Plate VI, fig. b); three have one strong barb and a second smaller one on the opposite edge near the distal end (Plate VI, fig. c). One specimen (Plate VI, fig. a) has five unilateral barbs. None has drilled lashing holes. One harpoon head (Plate VI, fig. g) is of the Thule 3 type with a triangular copper end blade held in place by thongs, which may have passed through the line hole.

The remainder of the artifacts fit into the general pattern of Canadian Thule culture and include the following classes: large triangular harpoon end blade of ground slate (Plate VI, fig. m); tubular harpoon foreshaft socket piece (Plate VI, fig. h); harpoon finger rest (Plate VI, fig. i); harpoon ice pick (?) (Plate VI, figs. j,k); wooden plug; antler arrowhead with conical tang and opposed spurs, with lanceolate blade or single barb (Plate VII, figs. b–e); end bladed arrowhead (Plate VII, fig. a); flat, triangular or rhombic wound pins (Plate VII, figs. f,g); two types of bird dart side prong (Plate VII, figs. l–o); bolas ball (Plate VII, fig. h); two types of leister barb (Plate VII, figs. i,j); bone fish lure (Plate VII, fig. p); toy wooden bow; flaker handle (Plate VII, fig. k); women's knife handles (Plate VIII, figs. d,e) and slate blade fragments; whittling knife, one with a fragment of iron blade (Plate VIII, figs. a,b); drill spindle (Plate VIII, fig. c); antler axe socket similar to a Thule adze socket but apparently mounted as an axe (Plate VIII, fig. h); wooden ice scoop; whale bone mattock blade; firedrill hearth; trace buckle (Plate VIII, fig. g); umiak harpoon rest (Plate VIII, fig. i); whale bone snow goggles (Plate VIII, fig. f); marrow spatula; plain tubular needle case; whale effigy figures (Plate VI, fig. n); grooved and drilled animal teeth; small wood and stone dolls; drilled nephrite bead; soapstone pendant; bracelet made by beating several small pieces of copper around a roll of sewn skin. One small triangular chert end blade (Plate VI, fig. l) resembles a Dorset culture form, especially the concave base end blades found at the late Dorset sites T2 (Collins 1957: Plate 10, fig. 15), and Mill Island (O'Bryan 1953: Plate 11, figs. k,l). Only 11 soapstone vessel fragments were found, in contrast to over 100 sherds of plain black pottery with extremely soft and coarse paste, heavily tempered with sand and fine gravel. A few rim sherds probably came from lamps; the majority, however, appear to be from pots with vertical or slightly convex sides and rim diameters of 200 to 300 mm. None of the sherds is decorated.

Thule 2 harpoon heads are the dominant type at early Canadian Thule culture sites such as Naujan (Mathiassen 1927: 15). The extremely high proportion of this type at the Memorana site suggests a fairly early date. The presence of lashing slots instead of drilled lashing holes on the harpoon heads, the whale effigy figures, the predominant use of pottery instead of soapstone vessels, and the use of wooden house supports, all suggest rather close relationships to the western Arctic. The occupation of the Memorana site may have been contemporaneous with the Nunagiak phase at Point Barrow (Ford 1959: 243) and likely occurred between A.D. 1200 and A.D. 1500. A single radiocarbon date of A.D. 130 ± 80 (Gak–1256) was obtained from the Memorana site. This date is impossibly early and must be rejected.

Several large sites in the survey area appear to have been occupied by later Thule culture people; none yielded more than a few artifacts. Site OhPo–3, located on the west side of Kuujjua River, consists of eleven shallow semi-subterranean house ruins distributed along the edge of a terrace 500 yards inland from Minto Inlet. The houses are much less massively constructed than those at the Memorana site, flagstone platforms are absent, and long entrance passages slope down the scarp of the terrace. The site produced a few fragments of bone refuse, a few sherds of plain black pottery, and a worked antler shaft, which may be a dog-whip handle. A small piece of oilcloth was found beneath frozen turf in one of the entrance passages but is probably intrusive inasmuch as the site was disturbed by children during the 1930's. The children apparently had no better luck than we did for they continued their excavation across the river at site OhPo–6.

OhPo–6, which is located to the east of Kuujjua River, consists of three house ruins of the same type as those found at OhPo–3. Artifacts from this site were purportedly sent to the Roman Catholic Museum at Churchill during the 1930's. Our excavations produced six arrowheads with conical knobbed tangs and single barbs, a barbed dart head, the centre-prong of a toy fish spear, a flat wound pin, a bolas ball, a harpoon ice pick, an asymmetric bone knife, a metapodial scraper, a whale bone adze socket without mounting holes or notches, a short whale bone mattock blade, a wound plug, and a wooden ladle fragment.

Site OhPo–1, located on the shore of a small bay five miles west of Kuujjua River, consists of fifteen caches and tent rings scattered over a cobble beach.

Artifacts were found only in association with the burial of a child in a stone grave and included a wooden fish needle, a toy Thule 3 harpoon head with drilled lashing holes, a bear tooth, and several pieces of drilled antler mounting. The few refuse bone fragments were all identified as seal, although whale bones were scattered farther down the beach.

OhPo–2 lies just above the mouth and on the east bank of the Kuujjua River. The site includes one hundred and fifteen boulder structures, of which forty-four are tent rings, one is a rectangular stone house, and the rest are heavy rectangular caches and burial vaults. The most characteristic structure is a small (average 7 by 8 feet) oval tent ring of heavy boulders with a line of boulders across the shorter axis. Only six artifacts were found: a flat antler lance head with end blade socket, three arrowheads with conical spurred tangs and single barbs, a triangular ground slate end blade, and a fragment of ground slate blade for a woman's knife. A chalcopyrite nodule and five iron fragments, all apparently cut from the blade of a rip-saw, were also associated with the structures. The few fragments of bone refuse all appear to be seal. Three burials were removed from stone vault graves.

OePr–1 is located on a rocky point across the bay from the present settlement of Holman. The site contains the ruins of three rectangular stone houses and a few tent rings and caches similar to those found at OhPo–2. The only artifacts recovered are two pieces of worked antler and a worked soapstone fragment. OePr–2 lies around the point to the west of OePr–1; here we found about sixty structures of the same type as at OePr–1, as well as a few bones of seal, fish and bird, but we recovered no artifacts. OdPq–2 occupies a boulder beach on a point ten miles southeast of Holman and consists of thirty boulder structures of the same type as found at OhPo–2, as well as a few boulder lines or walls, and a structure four feet high, which appears to have had a corbelled roof. A wooden shaft and an adze handle were found on the surface.

Unproductive sites with stone structures similar to those found on the sites listed above have been noted at several locations in the Dolphin and Union Strait area (Jenness 1922: 57–8,82). The excellent preservation of surface material at the sites described above, as well as the saw-blade fragments at OhPo–2, suggests that some of these sites may have been occupied as late as the eighteenth or early nineteenth centuries.

COPPER ESKIMO SITES: OhPo–4; OdPq–3; OdPc–1,5,6; OdPb–1

Small surface collections of late prehistoric and early historic artifacts were obtained from site OhPo–4 at the mouth of Kuujjua River and from site OdPq–3, located ten miles southeast of Holman. The only large collection, however, came from four related sites near the mouth of Kuuk River (OdPc–1,5,6; OdPb–1). The largest of these is the Kunana Site (OdPc–1), located on a series of low terraces on the west bank and just above the mouth of Kuuk River. This site is associated with an extensive series of caribou-drive lanes and appears to have been used primarily as an autumn caribou hunting station. Of more than 3,000 refuse bones identified, caribou formed 96 per cent, bird 2 per cent, muskox 1 per cent, and seal 1 per cent.

The material culture recovered from this site is very similar to that collected ethnographically from the area, but there are three primary differences. First, the Kunana site produced several ground slate blades for women's knives, ground slate harpoon end blades, a ground stone adze blade, bone needles, and bone fish spear barbs. Copper and iron were used as the material for these artifacts by the historic Copper Eskimo (Jenness 1946). The second distinctive feature, which was not mentioned ethnographically, is the presence of several triangular pits approximately 5 by 7 feet in outside dimensions, which occur within circular or oval tent rings. These pits may be interpreted as the vestiges of a semi-subterranean autumn-house pattern. The third and most striking difference between the Kunana site collection and those made ethnographically is in the types of harpoon heads (Plate IX, figs. a–p). Of fifty-two harpoon heads found, only two are of the small Thule 3-like form that is characteristic of the ethnographic collections (Jenness 1946: 116). The remainder of the extremely varied sample shows little relation to standard harpoon head types, except in so far as most specimens can be interpreted as developments from Thule culture forms.

These three distinctive features of the Kunana site material culture, combined with the presence of trade goods, which appear to date the occupation in the latter half of the nineteenth century, suggest that late prehistoric Copper Eskimo culture exhibited a closer relationship to ancestral Thule or Thule-descended phases than would be supposed on the basis of ethnographic description.

CONCLUSIONS

The Minto Inlet-Prince Albert Sound area has been occupied since at least the Pre-Dorset period. Although surface collections of Pre-Dorset artifacts from two small localities are inadequate for reliable comparisons, the extensive use of chipped basalt and schist at OdPq–4 suggests comparison with mainland components such as Dismal 2. A few flakes of white quartzite were found at each of the Pre-Dorset sites, but this material was not used as extensively as at other Arctic Small Tool Tradition sites excavated by Taylor on Victoria and Banks Islands.

With the exception of one small camp site on Kuujjua River, Dorset culture material was concentrated around the mouth of Kuuk River where caribou hunting and fishing appear to have been the main subsistence activities. Of the six Dorset sites found, five are closely related to early Dorset culture as it is known from southeastern Victoria Island and the eastern Arctic. The high frequency of large side-notched and stemmed end blades suggests comparison with mainland components, such as Kamut Lake and Lockhart River. The two specimens identified as arrowheads are anomalous in Dorset culture as it is now known; if the identification is correct, use of the bow and arrow may have been localized in Dorset culture in this 'western Dorset' area. Occupation of the area by later phases of Dorset culture seems to have been quite limited, as was noted by Taylor (1967: 225).

Typical Thule culture is represented by only one site, OdPq–1. This site appears to have been occupied for a single season by a few families engaged in coastal sealing and caribou hunting. The material culture is most closely related to early Canadian Thule but bears a distinctive western Arctic stamp in the use of wooden house supports and in the use of pottery vessels and lamps. The period between the early Thule culture occupation and that of the late prehistoric Copper Eskimo remains poorly known. Although several large sites appear to have been occupied during this period, the number of artifacts and the amount of refuse collected from them are incredibly small. The only traits that might be considered to be characteristic of the period are oval to subrectangular semi-subterranean houses that have sloping entrance passages and lack flagstone floors and platforms, heavy oval tent rings that have a line of boulders across the shorter axis, and burials in stone graves. Some of these sites may have been occupied as late as the eighteenth century or early in the nineteenth.

Recognizable Copper Eskimo material culture was found only on sites that appear to have been occupied during the latter half of the nineteenth century. Although most of the artifacts found on these sites are similar to those collected ethnographically, the harpoon heads, tent-pits, and ground slate industry suggest that Copper Eskimo culture is descended from a Thule ancestry, and that the material culture of this group was changing rapidly during the period immediately prior to direct European contact in the early twentieth century.

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PLATES I to IX

PLATE I: PRE-DORSET ARTIFACTS

Fig.		*Catalogue No.*
a.	burin (?)	OhPo–5–1
b.	burin (?)	OhPo–5–22
c.	burin blank (?)	OhPo–5–24
d.	endscraper	OhPo–5–21
e.	side blade	OhPo–5–19
f.	flake scraper	OhPo–5–23
g.	end blade fragment (?)	OhPo–5–2
h.	burin (?)	OdPq–4–4
i.	end blade	Surface 15 miles west of Kuujjua R.
j.	burin	OdPq–4–6
k.	endscraper	OdPq–4–9
l.	endscraper	OdPq–4–8
m.	end blade	OdPq–4–3

PLATE I

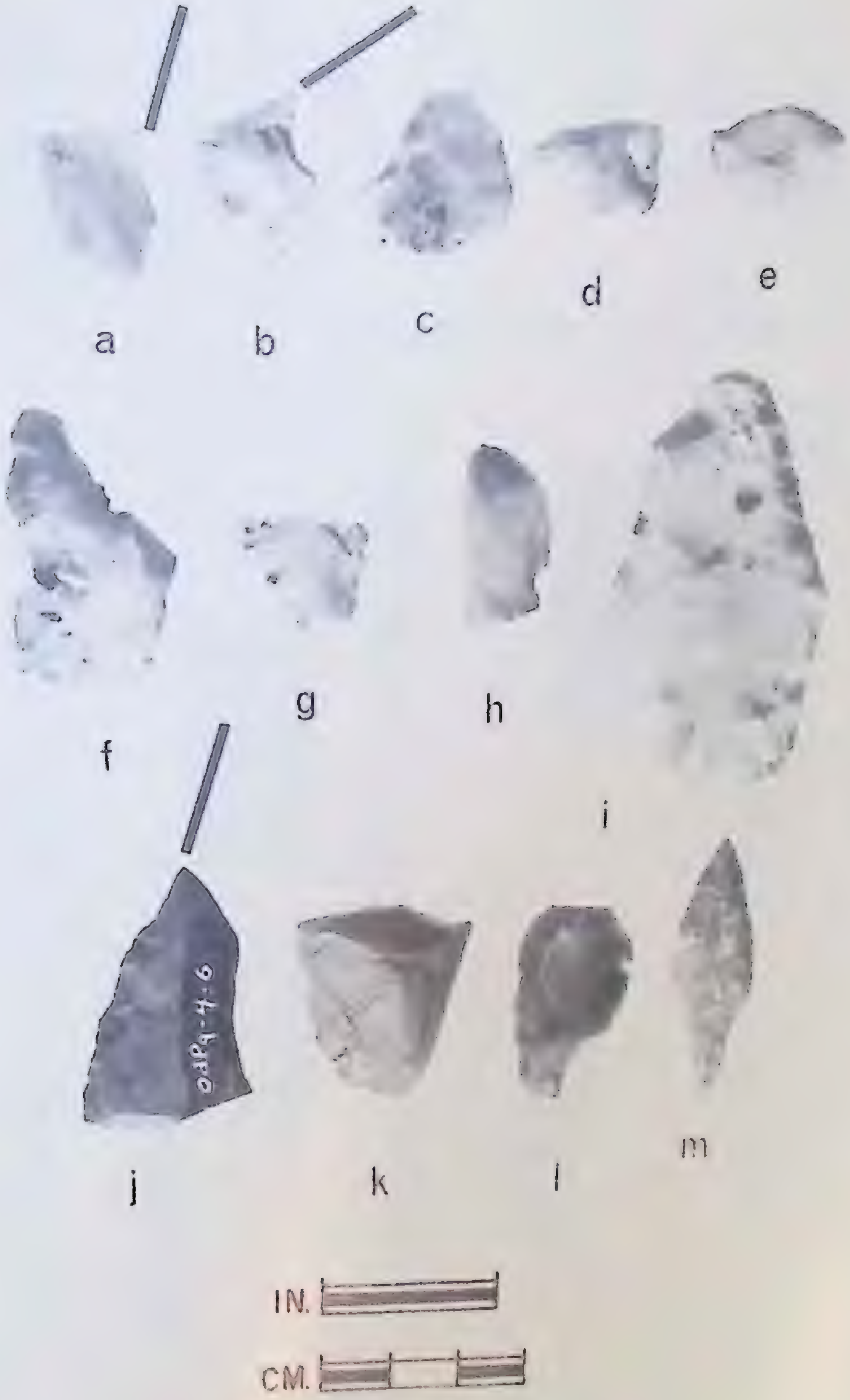


PLATE II: DORSET BONE ARTIFACTS, JOSS SITE

Fig.		*Catalogue No.*
a.	harpoon head	OdPc–2–171
b.	harpoon head	OdPc–2–241
c.	harpoon head	OdPc–2–269
d.	harpoon head	OdPc–2–35
e.	harpoon head	OdPc–2–158
f.	harpoon head	OdPc–2–210
g.	harpoon head	OdPc–2–76b
h.	harpoon or lance head	OdPc–2–64
i.	harpoon or lance head	OdPc–2–170
j.	dart head	OdPc–2–159
k.	ice pick (?)	OdPc–2–104
l.	arrowhead (?)	OdPc–2–194
m.	dart head	OdPc–2–36
n.	unidentified	OdPc–2–92
o.	foreshaft (?)	OdPc–2–181
p.	foreshaft (?)	OdPc–2–190
q.	ice pick (?)	OdPc–2–74

PLATE II

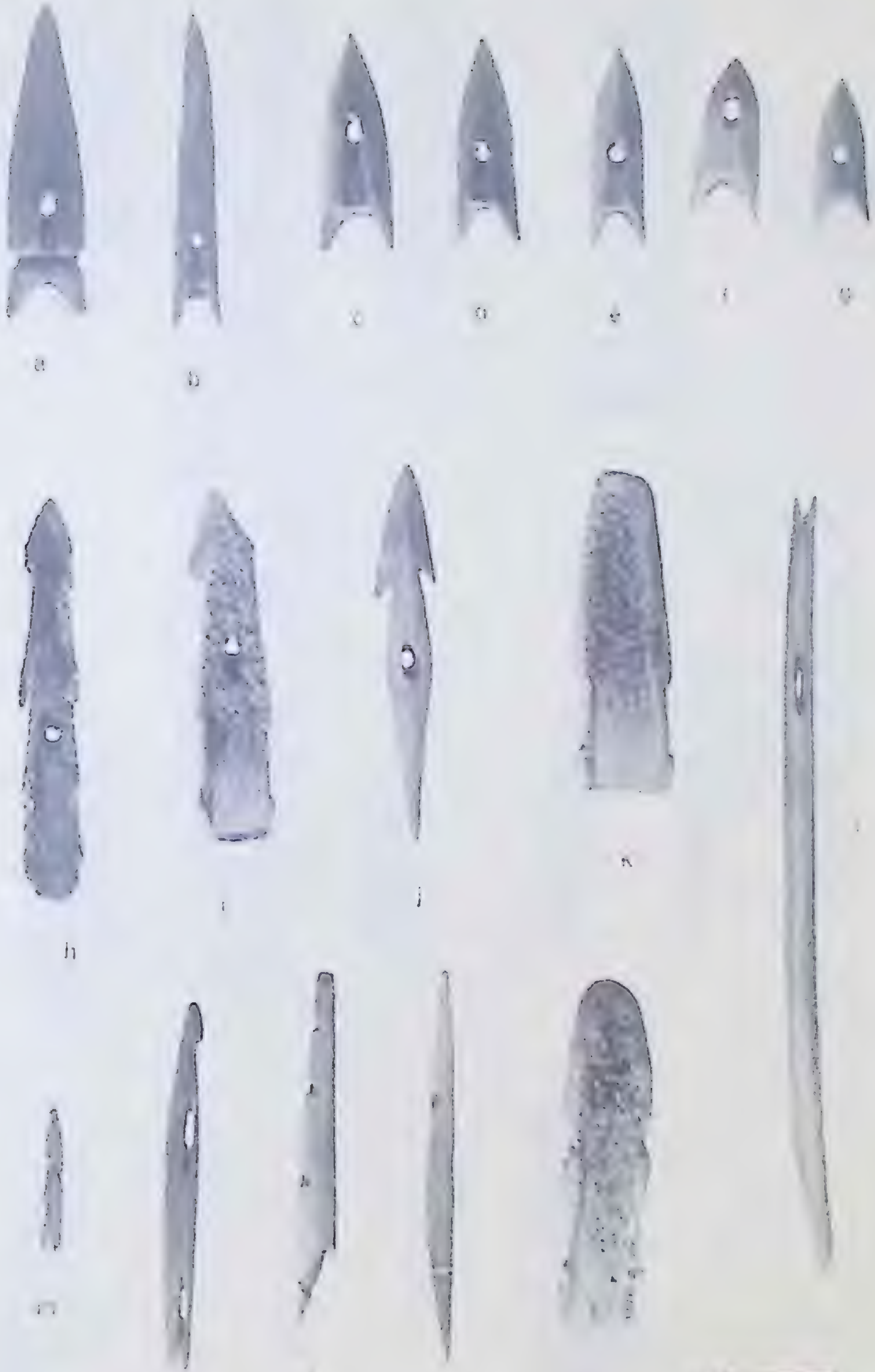
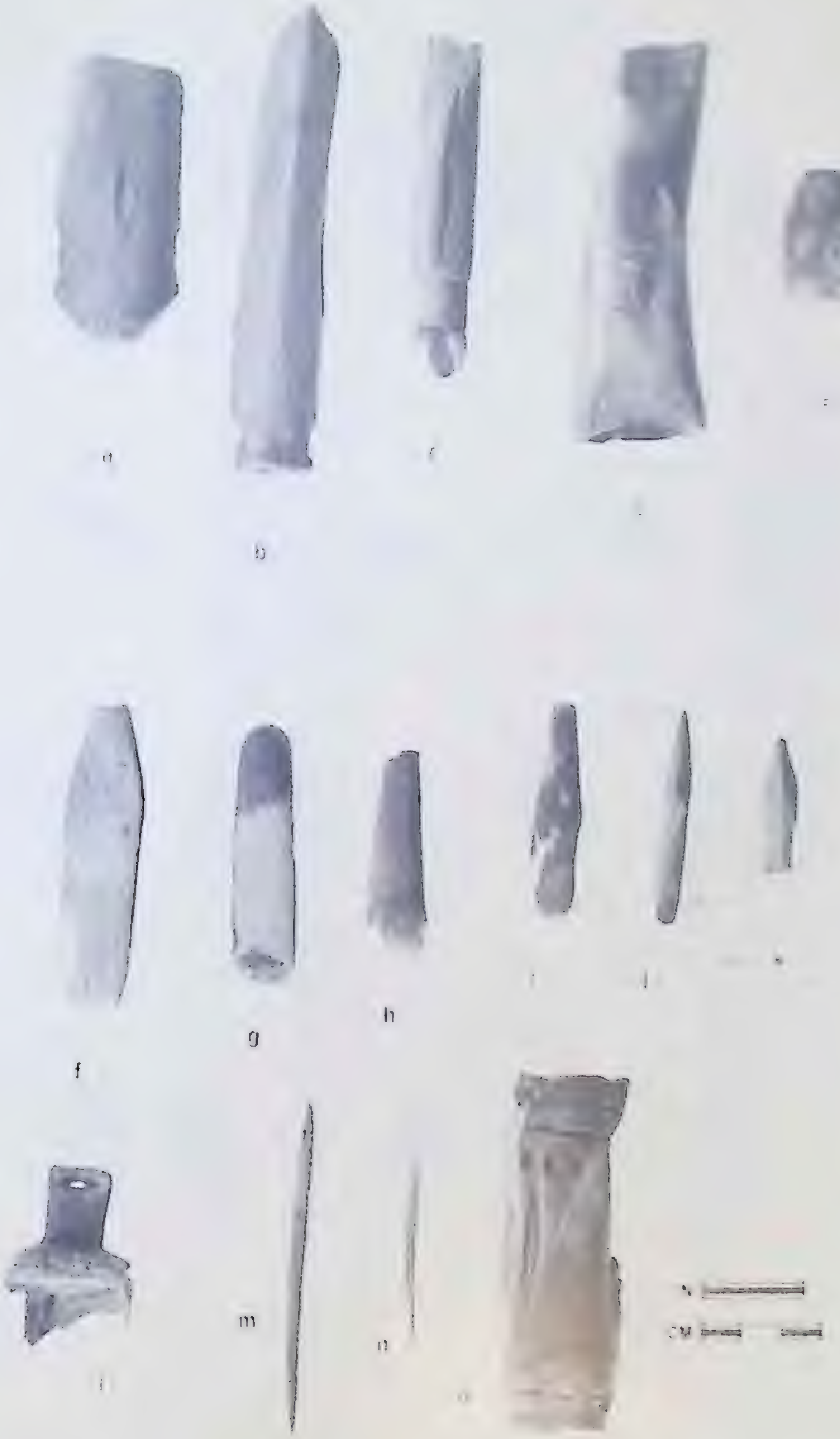


PLATE III: DORSET BONE ARTIFACTS, JOSS SITE

Fig.		*Catalogue No.*
a.	lance head fragment	OdPc–2–33
b.	lance head fragment	OdPc–2–160
c.	lance head fragment	OdPc–2–182
d.	adze socket	OdPc–2–267
e.	unidentified	OdPc–2–255
f.	flaker	OdPc–2–221a
g.	flaker	OdPc–2–206b
h.	unidentified fragment	OdPc–2–268
i.	unidentified fragment	OdPc–2–75
j.	small antler point	OdPc–2–157
k.	small antler point	OdPc–2–242
l.	ladle fragment	OdPc–2–207
m.	needle	OdPc–2–137
n.	needle	OdPc–2–213
o.	incised bone	OdPc–2–93


a
b
c
d
e
f
g
h
i
j
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l
m
n
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IN
CM

PLATE IV: DORSET STONE ARTIFACTS, JOSS SITE

Fig.		*Catalogue No.*
a.	end blade	OdPc–1–368
b.	end blade	OdPc–2–83
c.	end blade	OdPc–2–145
d.	end blade	OdPc–2–138
e.	end blade with burin facet	OdPc–2–57
f.	end blade	OdPc–2–187
g.	end blade	OdPc–1–99
h.	side blade	OdPc–2–85
i.	side blade	OdPc–2–232
j.	side blade	OdPc–2–120
k.	side blade	OdPc–2–26b
l.	biface fragment	OdPc–2–13
m.	biface fragment	OdPc–2–116
n.	end blade (scraper?)	OdPc–2–84
o.	endscraper	OdPc–2–88b
p.	endscraper	OdPc–2–127
q.	endscraper	OdPc–2–6c
r.	endscraper	OdPc–2–22
s.	burin-like tool	OdPc–2–261b
t.	burin-like tool	OdPc–2–248
u.	burin or burin-like tool	OdPc–2–233
v.	burin-like tool	OdPc–2–261a
w.	ground slate end blade	OdPc–2–10
x.	ground slate end blade	OdPc–2–228

PLATE IV

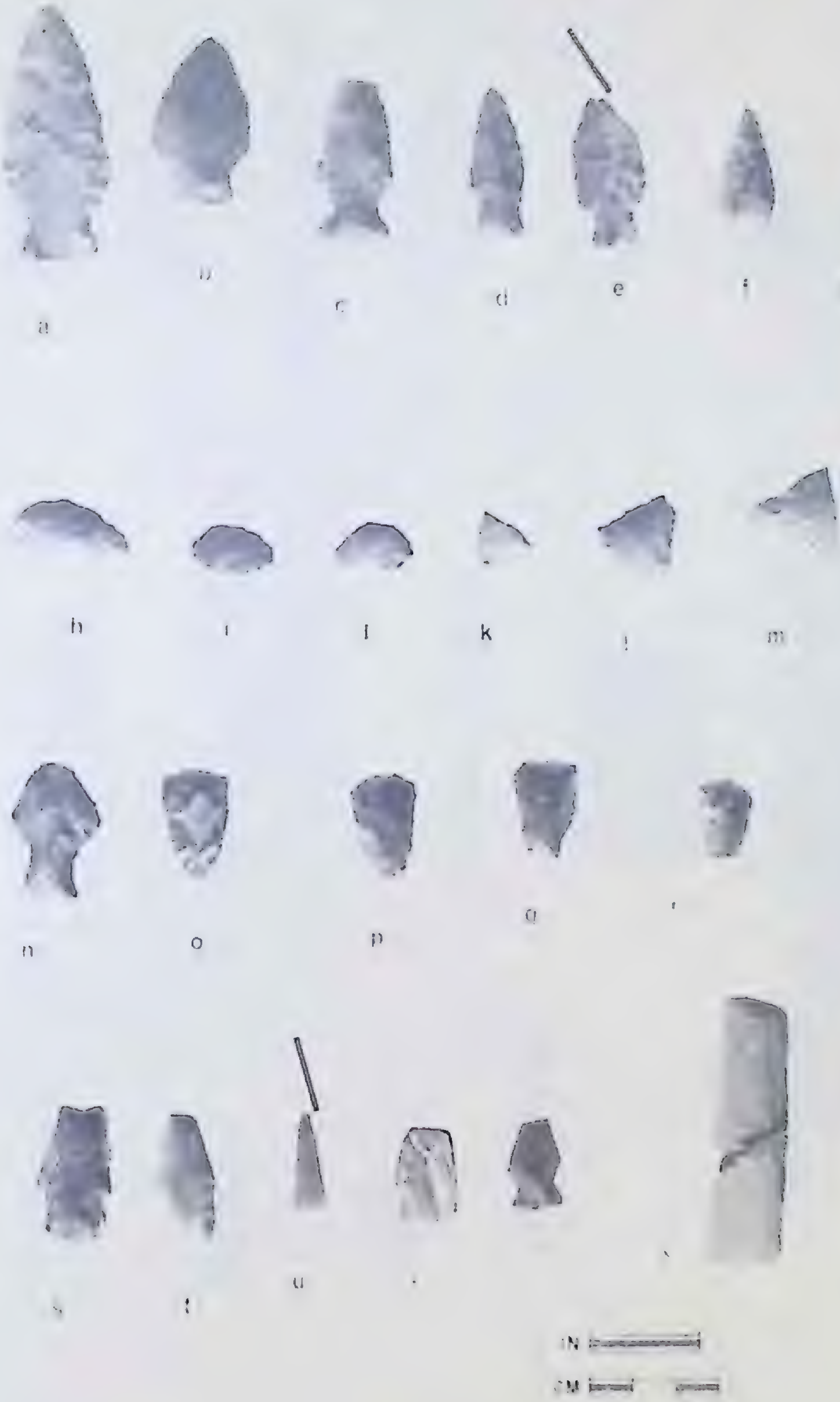


Plate V: Dorset Artifacts, Other Sites

Fig.		*Catalogue No.*
a.	harpoon head	OdPc–3–28a
b.	harpoon head	OdPc–3–28d
c.	foreshaft	OdPc–3–29
d.	end blade	OdPc–3–38
e.	end blade	OdPc–3–10b
f.	soapstone fragment	OdPc–3–43
g.	end blade	OdPc–4–21b
h.	end blade	OdPc–4–17
i.	arrowhead (?)	OdPc–4–8
j.	adze blade	OdPc–4–16
k.	end blade	OdPb–2–1
l.	harpoon head	OhPn–1–1
m.	end blade	OhPn–1–2
n.	harpoon head	OdPc–5–2
o.	sled cross-slat	OdPc–5–1

PLATE V

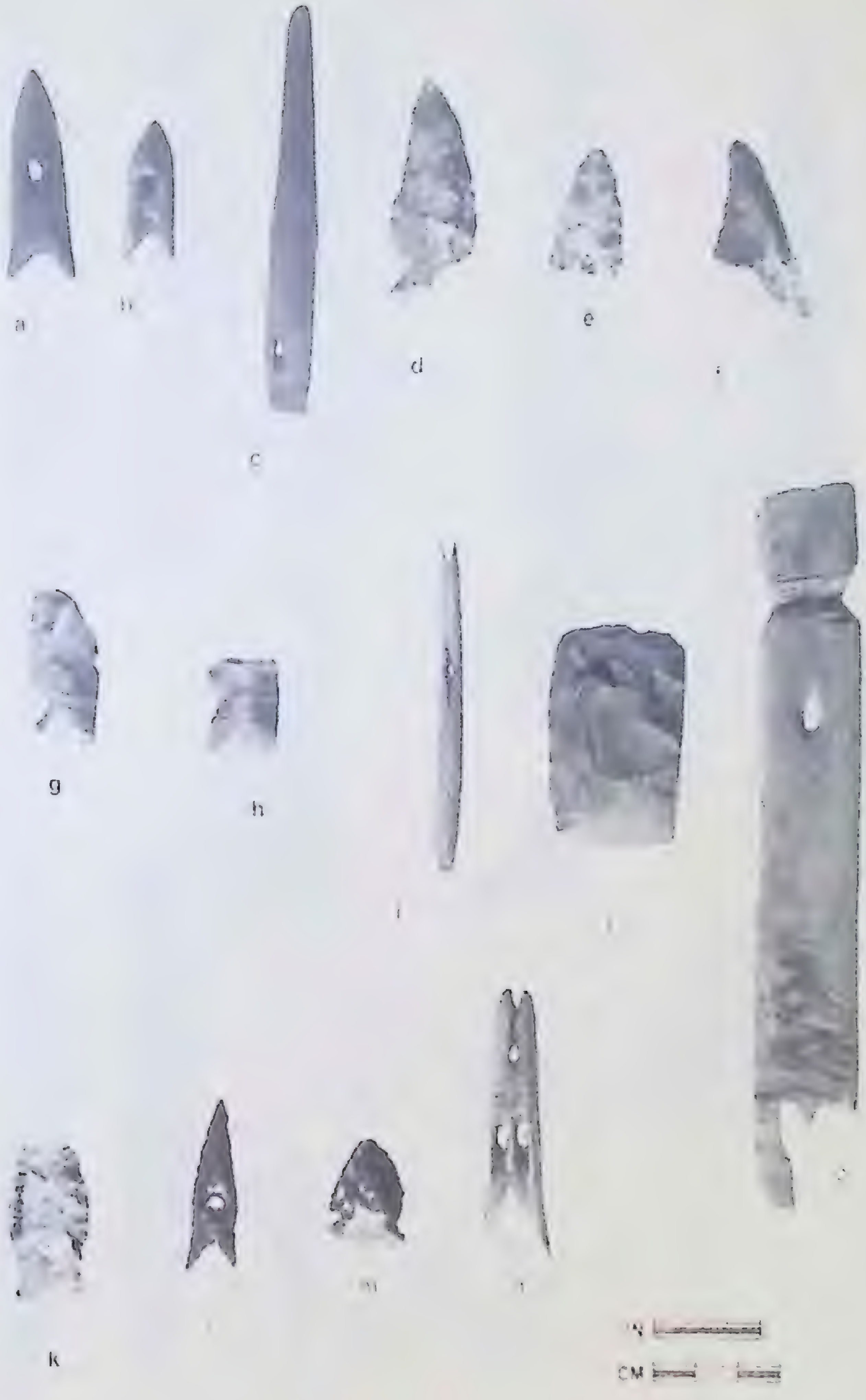


PLATE VI: THULE ARTIFACTS, MEMORANA SITE

Fig.		*Catalogue No.*
a.	harpoon head, Thule 2 variant	OdPq–1–152
b.	harpoon head, Thule 2 variant	OdPq–1–196
c.	harpoon head, Thule 2 variant	OdPq–1–26
d.	harpoon head, Thule 2	OdPq–1–1
e.	harpoon head, Thule 2	OdPq–1–23
g.	harpoon head, Thule 3	OdPq–1–149
h.	harpoon foreshaft socket	OdPq–1–37
i.	harpoon finger rest	OdPq–1–64
j.	harpoon ice pick (?)	OdPq–1–85
k.	harpoon ice pick (?)	OdPq–1–226
l.	end blade (Dorset?)	OdPq–1–3
m.	end blade	OdPq–1–255
n.	whale effigy figures	OdPq–1–264c OdPq–1–208 OdPq–1–78 OdPq–1–207

PLATE VI

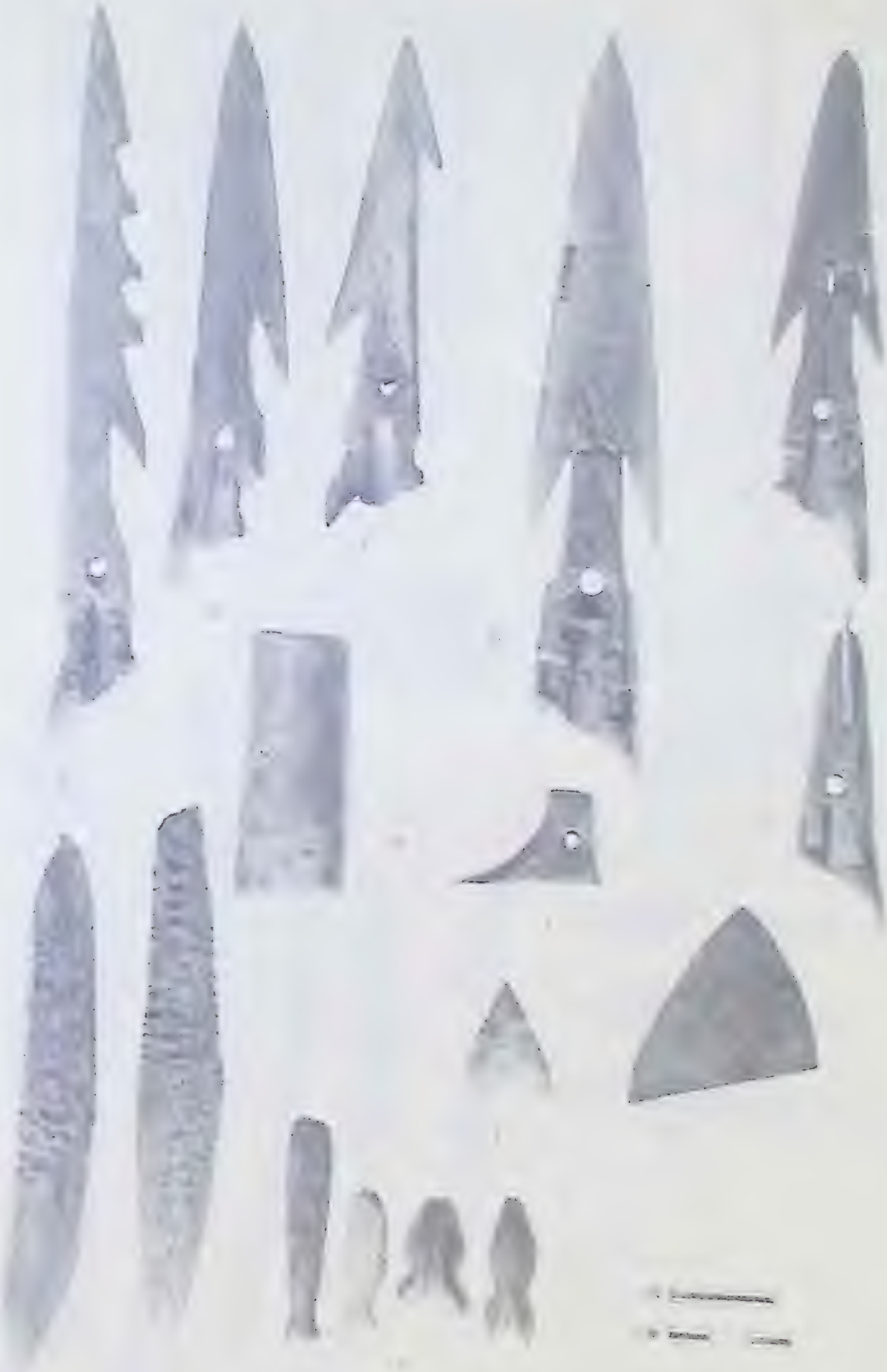


Plate VII: Thule Artifacts, Memorana Site

Fig.		*Catalogue No.*
a.	arrowhead	OdPq–1–116
b.	arrowhead	OdPq–1–205
c.	arrowhead	OdPq–1–148
d.	arrowhead	OdPq–1–186
e.	arrowhead	OdPq–1–70
f.	wound pin	OdPq–1–29
g.	wound pin	OdPq–1–204
h.	bolas ball	OdPq–1–258
i.	fish spear barb	OdPq–1–58
j.	fish spear barb	OdPq–1–229
k.	flaker handle (?)	OdPq–1–97
l.	bird dart side prong	OdPq–1–256
m.	bird dart side prong	OdPq–1–177
n.	bird dart side prong	OdPq–1–18
o.	bird dart side prong	OdPq–1–90
p.	bone fish lures	OdPq–1–127 OdPq–1–264a OdPq–1–264b

PLATE VII

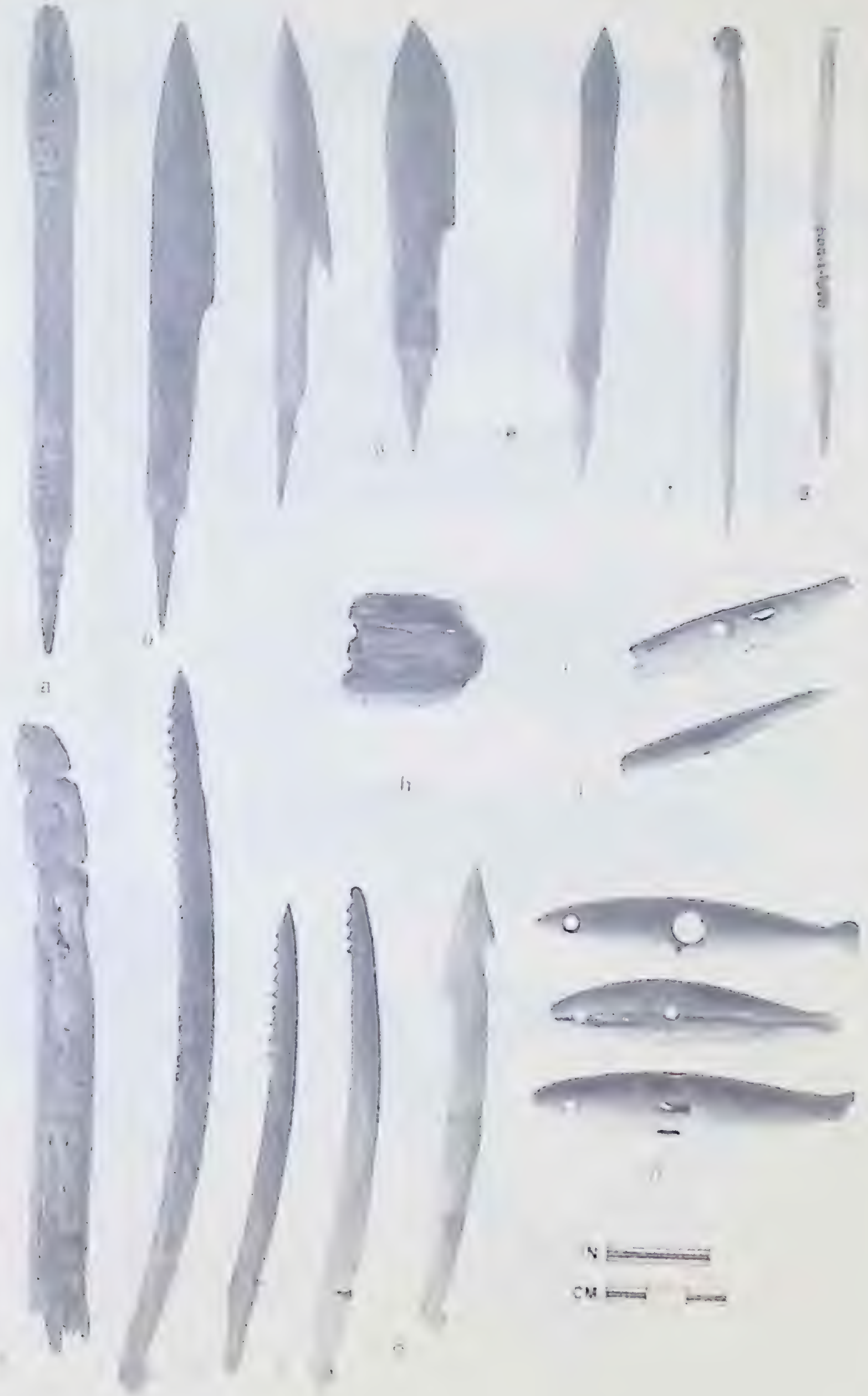


PLATE VIII: THULE ARTIFACTS, MEMORANA SITE

Fig.		*Catalogue No.*
a.	whittling knife handle	OdPq-1-164
b.	whittling knife handle	OdPq-1-46
c.	drill spindle	OdPq-1-44
d.	women's knife handle	OdPq-1-13
e.	women's knife handle	OdPq-1-201
f.	snow goggles	OdPq-1-17
g.	trace toggle	OdPq-1-227
h.	axe socket	OdPq-1-185
i.	umiak harpoon rest	OdPq-1-254

PLATE VIII

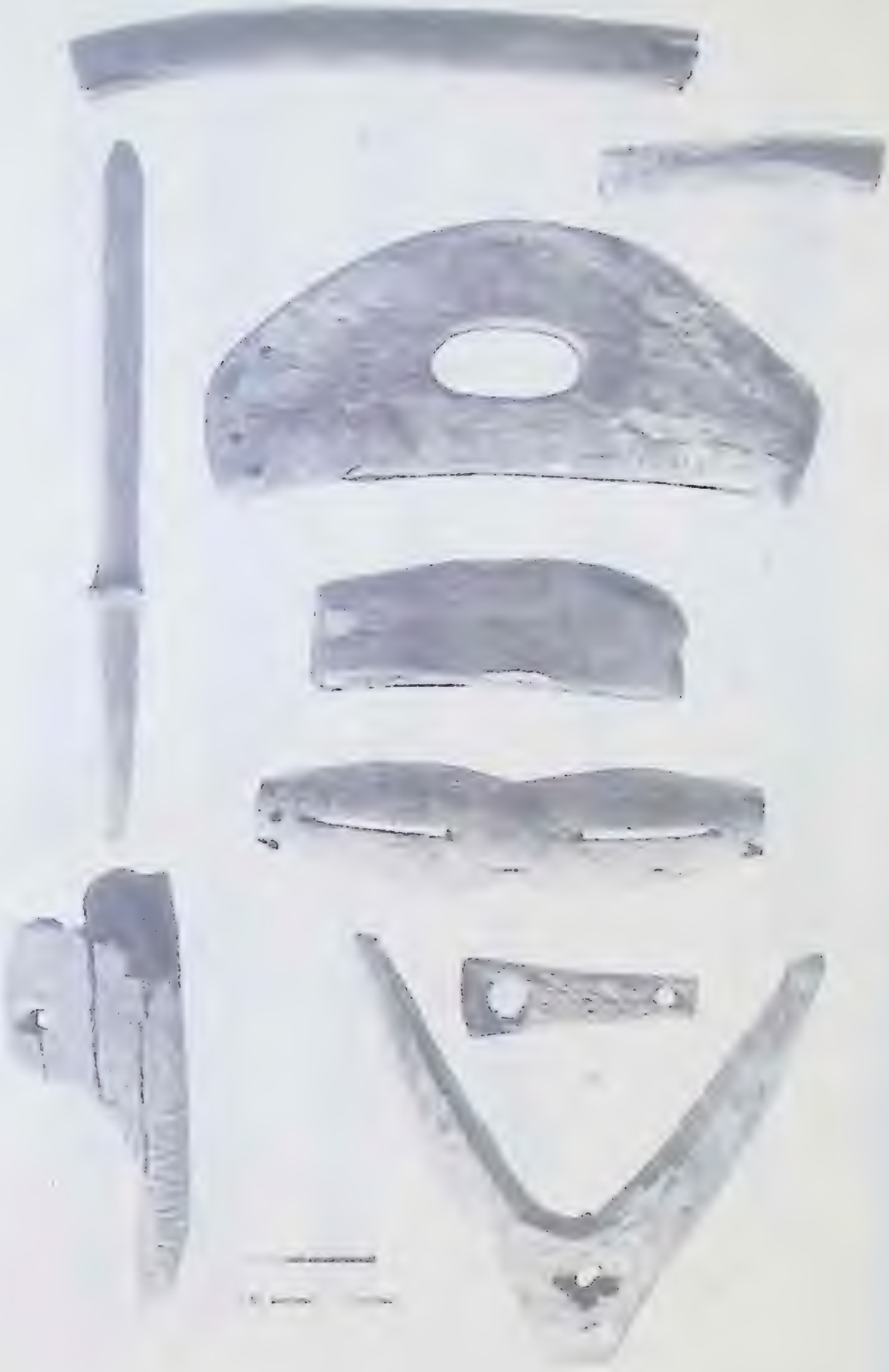
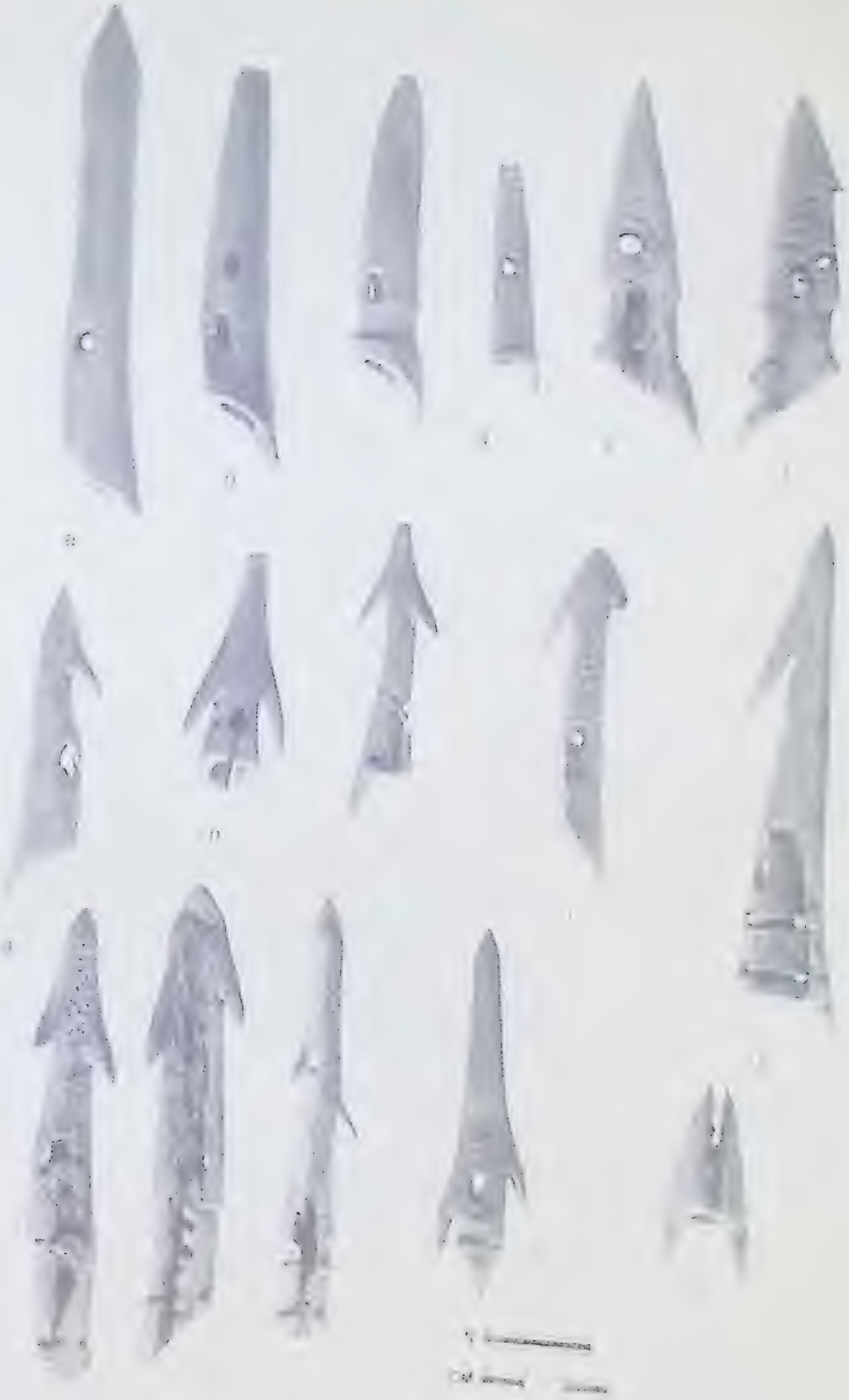


PLATE IX: KUNANA SITE HARPOON HEADS

Fig.		*Catalogue No.*
a.	harpoon head	OdPc–1–546
b.	harpoon head	OdPc–1–458
c.	harpoon head	OdPc–1–311
d.	harpoon head	OdPc–1–402
e.	harpoon head	OdPc–1–364
f.	harpoon head	OdPc–1–68a
g.	harpoon head	OdPc–1–273
h.	harpoon head	OdPc–1–437
i.	harpoon head	OdPc–1–390
j.	harpoon head	OdPc–1–330
k.	harpoon head	OdPc–1–433
l.	harpoon head	OdPc–1–355
m.	harpoon head	OdPc–1–541
n.	harpoon head	OdPc–1–483
o.	harpoon head	OdPc–1–420
p.	harpoon head	OdPc–1–366

PLATE IX



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Bulletin, no. 232

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